response in the region. Two teams were formed, one working on outbreak response, and the other on outbreak preparedness. Many expert staff passed through WPRO for briefings on their way to join field teams in areas such as mainland China, Hong Kong and Singapore. The large WPRO team based in Manila consisted of epidemiologists, logistics officers, infection control specialists, laboratory specialists, public health physicians, media officers and administrative support staff. Regular daily teleconferences were held with in-country teams, WPRO and WHO headquarters in Geneva. Teleconferences were also held with unaffected countries such as the Pacific Island Countries, so that WPRO could lend support to their SARS preparedness planning and activities.

Regional SARS Surveillance

A core function of the team at WPRO was to establish and monitor systems for regional surveillance of SARS. The potential for rapid, trans-border spread of SARS highlighted the necessity for good surveillance and reporting at a regional level. The WHO urged governments of member countries to email or fax daily updates of new, probable and suspect cases, and weekly line listings of probable cases. However, it took time for these systems to become established. In the early weeks of the outbreak, reports of SARS cases came from many unofficial sources such as the media, the internet, and by word of mouth. Rumours abounded! It was the unknown nature of the disease, and the level of public fear and paranoia that resulted in the rapid spread of rumours, aided greatly by the internet and mobile phones. A parallel surveillance system was needed, to deal with rumours and unofficial reports while they were either verified or dismissed.

Rumour Surveillance

The idea of rumour surveillance for communicable disease outbreaks is relatively new. Since the late 1990's the WHO has been conducting Alert and Response Operations, whereby a surveillance officer screens in-coming communications each day for events of potential international concern. This operation involves the collection and verification of reports of outbreaks from a variety of sources, which may include WHO regional or national offices, NGO's, the printed media, the internet, television and radio. An electronic surveillance tool developed by Health Canada has facilitated this process. Called the Global Public Health Information Network (GPHIN), this electronic system continuously monitors some 600 media sources including major newspapers and biomedical journals. The GPHIN identifies and extracts reports of outbreaks from the electronic media in real time, by searching for key words such as "outbreak" or "infectious disease". The WHO Alert and Response Operations produces a weekly electronic Outbreak Verification List (OVL) which incorporates information provided by GPHIN. (1) (2)

These systems are not disease-specific – they allow the tracking of rumours for a variety of infectious diseases. The SARS rumour surveillance system used at WPRO is novel in that it is specific for an international outbreak of a single disease. It was developed at WPRO by Dr Conchy Roces, a Filipino epidemiologist who was my predecessor in the SARS Outbreak Response team. This system does not employ a software package, but relies on information forwarded by GPHIN and the OVL, in addition to a manual system of searching for and collating SARS rumours from other sources.

Objectives

The objectives of this surveillance system are:

- to collate rumours of SARS cases originating from within the region
- to verify or dismiss these rumours through further investigation
- to disseminate information about verified rumours so that appropriate public health action occurs

Methods

In addition to information forwarded via the GPHIN and OVL, other sources of rumours included printed media, on-line newspapers, e-mail discussion groups such as ProMed-mail, anonymous emails, word of mouth reports from WHO country representatives and other contact points such as embassy staff. Each morning, I would scan local newspapers and a range of international on-line news sources. The Media Department at the WPRO office assisted with

this task. Emails from members of the public or from WHO staff in various countries were forwarded to me from the WHO Geneva SARS surveillance team. To verify a rumour, the existing network of WHO representatives in each country was utilised. The rumour would be directed to the appropriate WHO representative who would then seek verification from the Ministry of Health in that country. Dissemination of this information was especially important for events with cross-border relevance, for instance, rumoured SARS cases on board flights or ships. The regular teleconferences with WPRO countries were a valuable conduit for both receiving and verifying rumours.

Excel spreadsheets and Word documents were used to record and update these rumours on a daily basis. The resultant rumour update lists were then forwarded to the WHO Headquarters in Geneva on a daily basis, and to WHO representatives in WPRO member countries on a biweekly basis.

Results

Over a 10 week period more than 200 rumours were followed from 44 countries. The breakdown of the source of these rumours was as follows:

Source	Proportion of rumours
Media (including internet)	37%
WHO country representatives/teams	25%
Promed digest	7%
Members of public	5%
Embassy staff	1%
No source documented	25%

Mainland China was responsible for the greatest number of rumours (14%), followed by the Philippines (11%), Taiwan (8%), Hong Kong (7%), Malaysia (7%), Singapore (6%), India (5%), Vietnam (4%), Macau (3%), Indonesia (2%) and Thailand (2%). Approximately 1% of rumours came from Australia.

Some examples of rumours received by the WHO are included below:

Anonymous emails:

- *I'm a …… student actually doing an internship in …. (……. province, China) and I can confirm you from a medical source that, last week, a hospital in the city has admitted 5 people suffering from the SARS. Actually, at least one of them is dead but the Chinese authorities are trying to hide the truth. Thank you for verifying and publishing these informations. (sic)*

  Good luck. (unconfirmed rumour)

- *"I saw something yesterday that might be of interest to WHO:*

  On my way home from work at 5:30 PM along an almost deserted road in northern Beijing we came across a caravan of ambulances carrying 6 to 7 people in the back of each one. I didn't think too much until I saw ambulance after ambulance and when I looked back at some of the ambulances, I saw that the drivers and the people in the passenger seat were completely covered with head and facial masks. The caravan was being escorted by the police".

  (confirmed rumour)

Media headlines:

- *SARS disclosed: A Corner Of The Iceberg Meltdown:* Last Year In October, All Villagers In One Village In Shanxi Province Suffered From A Mysterious Disease And All Died.

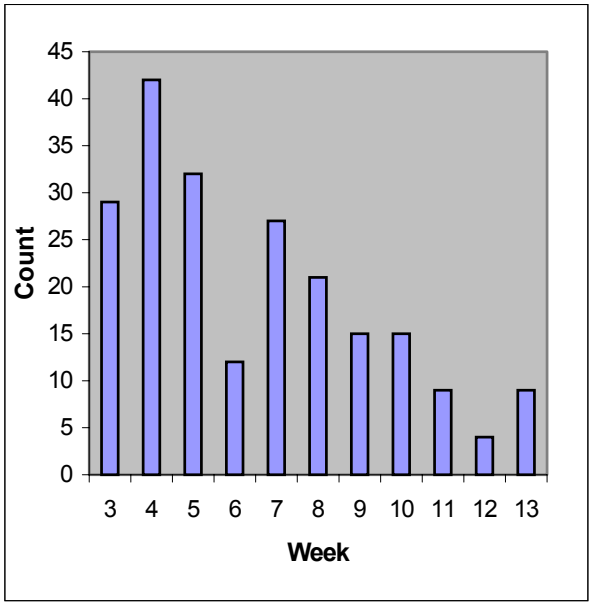
  News Source: Dajiyuan.com - April 14

  (unconfirmed rumour)

It was not always possible to verify rumours. With mainland China and Taiwan, for example, it was difficult to follow-up rumours due to the political nature of relationships between the governments and the WHO. Of all the rumours occurring over the 10 week period from 25 March to 10 June, 34% were confirmed to be true and 37% were able to be dismissed. For 29% of rumours, no definitive outcome was obtained, with the majority of these originating from mainland China and Taiwan.

The number of rumours received per week is illustrated in the figure below. Week 6 was the first week in which I took over rumour surveillance from Dr Conchy Roces. The observed dip in numbers in that week probably does not reflect the true situation. The number of rumours detected is dependent on the time spent searching media and internet sources, and the number of sources searched. For that reason the numbers themselves are not as meaningful as the trend over time.

Figure. WPRO rumour count by week of outbreak



Discussion

There are several benefits of rumour surveillance in an international outbreak setting. For one, it increases the sensitivity of the official surveillance systems and may well provide early warning of new clusters in advance of official notification, as the media are often the first to know of potential cases. Secondly, the political impact of rumours provides the WHO with leverage to compel Ministries of Health to investigate further; this was noted particularly by the WHO team in China. Additionally, a change in the volume of rumours over time from a particular locality is a reasonable indicator of trend in disease activity. Again, this has been noted in China, where the newspapers contained many SARS rumours in March and April, and now contain very few. Lastly, rumours have also assisted in the generation of hypotheses about potential epidemiological links between cases.

An obvious disadvantage of the system is that it is very time consuming. When official reporting systems are well established and reliable, rumour surveillance may not add greatly to the information already available.

Conclusion

Rumour surveillance can be an important tool for enhanced surveillance, particularly early in the outbreak response, with a diminishing role as the outbreak evolves. It is likely that rumours will be a significant feature of any future international outbreaks, as with modern technology, the international spread of rumours is as fast as that of the viruses themselves.

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2. *Rumours of Disease in the Global Village: Outbreak Verification*, Grein T et al, WHO Geneva, Emerging Infectious Diseases, Vol 6. No 2, March-April 2000

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NT Preparedness for SARS

In mid March 2003 the WHO issued a global alert for an illness caused by an unknown agent that presented with fever and severe pneumonia or adult respiratory distress syndrome and was described as Severe Acute Respiratory Syndrome---SARS. With a global network primed and working together, an agent was subsequently identified which was a previously unknown human coronavirus, referred to as the 'SARS–associated coronavirus' or HCo-SARS.

Local transmission of SARS has been reported in mainland China, Hong Kong, Taiwan, Vietnam, Singapore, The Philippines (Manila) and Canada (Toronto).

The case definition for a "suspect" case of SARS included:

- a high fever, > 38°C and respiratory symptoms (cough or breathing difficulty)

AND

- residency or travel to an affected area in the previous 10 days;

OR

- close contact with a suspect or probable case

The case definition for a "probable" case of SARS included:

- a suspect case with evidence of X-ray changes of pneumonia or respiratory distress syndrome (RDS)

OR

- (as a recent addition) a suspect case who has tested positive for SARS coronavirus by one or more assays.

As of 30 June 2003, globally 8447 probable SARS cases and 811 deaths had been reported to WHO. Taiwan and Toronto remain the only two areas on the list of SARS affected countries. Pending no new cases being detected in these 2 areas, both will go though 2 incubation periods (10 day incubation period x 2 = 20 days) and be removed from the list by the end of the first week in July. In Australia as of June 30 137 patients who met the WHO case definition have been investigated with 27 initially investigated as probable cases and 110 as suspect cases and 5 probable cases going on to be reported to WHO. In the NT 2 probable cases were investigated and subsequently ruled out with one being diagnosed with influenza A and the other responding rapidly to antibiotics.

The Northern Territory (NT) Department of Health and Community Services (DHCS), via the Centre for Disease Control (CDC) initiated a number of strategies to ready itself and respond to the threat of SARS. CDC has also participated in, and contributed to, the Communicable Diseases Network Australia (CDNA), the peak national body charged with managing the public health aspects of communicable diseases and hence the putting in place of national strategies to control SARS and safeguard Australia.

Since the national alert went out in mid March, daily information has been gathered by the Commonwealth and discussed by the CDNA. Teleconferences, chaired by NT CDC Director, Dr Vicki Krause, to update each State and Territory on global SARS numbers, the new cases (and deaths) and the countries affected occurred daily, initially including weekends, and then tri-weekly from May. Changes and updates to world travel warnings were also reported. Information regarding the illness, causative agent, diagnostic techniques, incubation period, communicability and the measures to manage and stop the spread of SARS have been discussed and response strategies developed. Suspect and probable cases in each State/ Territory have been reviewed. The CDNA rapidly produced guidelines and protocols such as the *Australian Infection Control Guidelines for SARS* and *Work/School precautions for travellers from SARS affected areas* to guide health-care workers and the community in necessary measures for control.

The NT CDC has distributed these local, national and international updates daily to key health, community and hospital staff in Darwin and to CDC staff in other districts who distribute to local health, hospital and infection control staff creating a well organised and well informed NT-wide unit. Departmental resources such as contact tracing teams and professional and community education / awareness strategies were put in place to support implementation of control guidelines. These guidelines are applicable to other community settings such as

childcare centres and aged care facilities. CDC has been liaising with individual schools to advise them on the management of students returning or entering Australian schools (as boarding students from high-risk countries) per national protocol guidelines.

A national initiative introduced standardised signs for display at entrances to hospitals, emergency departments and other health care facilities and are found at all NT hospitals. The signs warn visitors who have been in SARS affected areas in the last 10 days not to enter the hospital if they are unwell, and also warn any presenting patients who have a cough or fever to immediately declare any travel history if they have been in a SARS affected area or have been a contact of a SARS suspected patient.

A national policy was also introduced recommending that people who had been in SARS affected areas or contacts of SARS suspected patients not be admitted to hospital for elective surgery until 10 days after departure from the area. This was formalised in the NT with forms being distributed to all NT hospitals allowing for all patients with a hospital encounter to be screened with questions about travel. Elective patients who have travelled to SARS affected areas or have been known contacts are required to postpone their surgery. This is to avoid any confusion or misinterpretation of any post- operative symptoms (such as fever and cough), to avoid any potential complications of a patient's surgery and to eliminate the possibility of introducing SARS into the hospitals.

Patients requiring emergency admission who have travelled to a SARS affected areas or are contacts of suspected SARS cases in the previous 10 days and have fever and cough are dealt with as SARS suspects with proper infection control measures. Those without SARS symptoms were to be monitored daily by infection control staff during their admission in case their status should change.

Transmission of SARS has been documented to be from those with advanced illness, hence health care workers are at increased risk and emphasis has been placed on avoiding transmission to and from this group. There has been no exclusion period for travellers coming into the country unless they have had contact with a known SARS case or are health care workers and have worked in a facility with SARS patients.

Since 28 March, the Commonwealth Government recommended that there be announcements on all incoming international flights asking passengers to declare any symptoms of cough or fever to airline staff. This followed a change recommended by the Australian Quarantine and Inspection Service (AQIS) to 'positive pratiquing' meaning that airline pilots have to confirm that they have no sick passengers on board before they are cleared to land. Ships already carry out positive pratique.

On the 3 April, the Commonwealth Government, through the Department of Health and Ageing issued requirements for States and Territories to implement the following:

1) all aircraft routinely report any illness on incoming flights
2) the distribution of health alert notice cards to all incoming and outgoing international travellers
3) in flight announcements relating to SARS on all incoming international flights
4) the distribution of health advise and infection control guidelines to international airport staff
5) appropriately trained and equipped medical or nursing personnel be available to rapidly respond to any request from AQIS for an assessment of an airline passenger who is suspected of suffering from SARS.

In the NT CDC staff, doctors or nurses, at Darwin airport initially met all planes from Singapore and Brunei and Denpasar, Bali. In June this service was out-sourced to agency nurses. CDC staff and medical quarantine officers are on 24-hour call for all other incoming overseas flights including charters, cargo flights, unscheduled flights and those from Dili and for seafaring vessels entering Australian ports. There has been good communication and interchange with CDC and AQIS staff.

SARS became a nationally quarantinable condition formally on April 7, 2003 and a notifiable disease under the NT Notifiable Diseases and Public Health Act the same day

thereby putting in place further powers to detect and contain the disease if needed.

The CEO, Mr Robert Griew brought together representatives of NT hospitals and community staff to form the NT SARS Coordination Committee with Dr Vicki Krause designated as the SARS Epidemic Control Coordinator for the NT. The focus of the committee has been to review and affirm preparedness and capacity to respond should SARS cases occur.

A desktop exercise was run and the NT's preparedness to respond was tested and documented as adequate. Infection control procedures are in place, isolation and negative pressure rooms have been identified and the NT's ICU capacity evaluated. With respect to housing options it is likely that people would be quarantined in their homes in the event of an outbreak. For travellers to the NT requiring quarantine or isolation housing options have been identified.

Because of the fluid nature of the SARS epidemic, with countries coming on–and–off the affected list, accurate new information about the disease and its control is accrued daily. Providing up-to-date information has been vital and the NT has had systems in place to assure current information is utilised. Daily and weekly auditing processes have mainly been carried out by infection control staff and medical students. Lesley Scott and Chris Nagy of CDC are monitoring the implementation of the audits and revising protocols as necessary. The audits show that SARS screening for all NT hospital inpatient and outpatient encounters is occurring to a high standard.

In the NT, the DHCS, AQIS and other community services have literally been 'working around-the-clock' to address, put in place and maintain the measures and procedures required to minimise the risk of SARS being introduced and transmitted in the NT.

The first WHO Global Conference on SARS was held in Kuala Lumpur on 17 – 18 June. One prediction from the conference was that the next SARS outbreak is predicted to occur in November 2003.

A CDNA workshop is planned for July 4th to discuss further strategies for infection control once all countries are declared free of local transmission of SARS, i.e. no countries remain on the affected list. Step-down procedures will need to be put in place but balanced with appropriate measures to enhance surveillance for the possible reintroduction of SARS and to capture useful infection control initiatives and insights gained.

SARS prevention and control measures safeguarding the NT

Border activities -

- Flight announcements* and Information pamphlets*
- Flight and seaport 'positive practique' (sick passengers on board to be reported)
- SARS countries screen outgoing passengers

*Self Declaration cards were universally introduced June 16, 2003 see article page 8)

National activities via CDNA /Commonwealth/CMO -

- Daily teleconferences to work through issues and maintain awareness and uniformity of appropriate and responses
- Development of National Guidelines
- National media releases
- National website SARS information with links to e.g. WHO and CDC
- Frequently Asked Questions resource
- Travel advice for SARS affected areas
- SARS hotline

Contributions from Australian trained epidemiologists, public health experts, clinicians and scientists to the SARS response throughout the Region and internationally (Geneva)

NT activities -

- Educating health professionals through in-service programs, GP forums and updates provided by CDC staff and Dr Dale Fisher, who was practicing in Singapore during the beginning of the SARS outbreak, to ensure that policies and infection control information are disseminated and implemented.
- Regular NT media releases and public education via newspaper, radio and TV interviews
- Daily dissemination of SARS information to a well coordinated NT network
- Telephone advise provided from CDC for public and health professionals during weekdays
- Health care facility protection
  - Signs at entrances
  - Defer elective surgery
  - Individual patient interview and triage at hospital/clinic encounters
  - Infection control measures in place
  - 24 hour on call provided by CDC quarantine medical officers and infectious diseases physicians
  - Daily or weekly audit of the above
- NT SARS Coordination Committee formed
- SARS cost code instituted

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Evaluation of SARS audit at Darwin International Airport

Rosalind Webby, MAE Scholar, CDC Darwin and Vicki Krause, CDC Darwin

Background

The prevention of transmission of severe acute respiratory syndrome (SARS) via international air travel has been a recent major public health challenge. The World Health Organisation's (WHO) recommendation for pre-departure screening for all passengers from SARS affected countries has been implemented. Such screening involves answering 2 or 3 questions and may include a temperature check. Travellers with one or more symptoms of SARS and a history of exposure or those with fever or who appear acutely unwell are to be assessed by a health care worker and may be advised to postpone their trip until they have recovered.

WHO has also recommended that people arriving from areas with local transmission of SARS obtain information about SARS and seek medical advice if they develop any symptoms in the 10 days following their departure from an affected area.[1]

Several measures to reduce the possible spread of SARS into Australia have been implemented. By the end of the first week of April SARS became a quarantinable disease. Starting on April 5 health personnel were posted at all international airports and incoming passengers received a verbal in-flight announcement regarding SARS and a printed health alert card on arrival in Australia. The health alert card gives information about SARS and instructions for passengers from SARS affected countries of what they should do if they become unwell with fever and cough within 10 days of departure. The airlines are required to report any passengers or crew on board who are unwell. Before landing the crew apply for quarantine clearance stating that everyone is well or identifying the presence of any ill passengers or crew on board. This is called a 'positive pratique' and is also required of all incoming international shipping vessels. On landing, any passengers or crew suspected of having a SARS-like illness, on direction from the AQIS officer, are interviewed by a state or territory health professional (wearing appropriate infection control protective equipment), have their temperature taken, and are referred, where indicated, for further medical review.[2]

An audit was conducted at the Darwin International airport between 30 April 2003 and 16 May 2003 to assess the effectiveness of Australian border screening of incoming passengers for SARS from affected countries.

Aim

The aim of the audit was to assess whether the verbal and written health information regarding SARS was delivered and to assess whether passengers understood the advice given.

Method

Incoming passengers from Singapore, Denpasar and Brunei between 30 April 2003 and 16 May 2003 were interviewed. Though Denpasar and Brunei are not SARS affected areas many passengers originating from China, Vietnam and the Philippines, connect with flights in Denpasar or Brunei to fly on to Australia. The passengers were interviewed as they cleared customs and quarantine. The arriving passenger group from first class to economy was interviewed opportunistically with approximately every 4th passenger being surveyed. Random sampling was not possible due to time and resource limitations.

The passengers were asked 4 simple questions including:

1. Did you hear the pilot's announcement about SARS?
2. What did the announcement tell you to do?
3. Did you receive a pamphlet on SARS?
4. What language do you speak at home?

The interviewer, by observation, recorded sex and an estimate of age (under or over 50 years of age).

Results

General

The data was analysed using STATA 7 statistical program. A total of 1442 passengers arrived from Singapore, Denpasar and Brunei during the 17-day period of the audit and 384 (27%) were approached for interview. Of the interviewed passengers 60% were male and 73% were estimated to be less than 50 years of age.

Announcement

Of the 384 interviewed passengers

- 296 (77%) stated they heard the announcement about SARS by the pilot on the plane,
- 62 (16%) said they did not hear the announcement and
- 26 (7%) were non-English speaking and could not answer the question.

Of the 296 people who heard the announcement:

- 226 (76%) were able to explain what the announcement told them to do,
- 67 (23%) did not remember or could not explain the announcement and
- 3 (1%) did not answer the question.

Correct explanations included knowing to report symptoms such as fever and cough to the airline crew in flight or medical staff when they landed.

Therefore, of all passengers interviewed, only 226 (59%) heard and understood the announcement.

Health Alert Cards

Of 355 passengers answering whether they had a yellow health alert card, 162 (46%) had a health alert card on arrival in Darwin. Of the 257 passengers from Singapore, only 142 (55%) had a health alert card on arrival.

Dissemination of cards varied enormously from flight to flight (0 to 100%) reflecting the varying behaviour of border officers. Some actively gave out the cards to passengers arriving on certain flights and others did not. The health alert cards were available on the customs desk but may not have been seen by passengers.

Language

The nationalities of the 26 non-English speaking passengers included 19 Germans, 2 Indonesian, 1 Thai and 4 Japanese. The language spoken at home was recorded for 372 passengers, showing 56% spoke English at home, 18% spoke German, 4% Filipino, 4% Dutch, 3 % Indonesian and 12 % other languages. The other languages included Bengali, Danish, Norwegian, Swedish, French, Greek, Chinese, Portuguese, Malay, Japanese, Bulgarian, Norwegian and Thai.

Conclusion

The aim of this audit was to evaluate if the information given to incoming passengers about SARS was received and comprehended. The outcome highlights that more needs to be done to improve the awareness and understanding about SARS to incoming passengers and to strengthen border protection measures.

Although, of the total number interviewed, 77% of people heard the announcement, only 59% understood the announcement. Only 46% of passengers assessed had a health alert card on entry into Australia.

The distribution of printed material has not been uniform across all flights. Passengers who did not receive the health alert card had no SARS health information or direction to refer to if they became unwell while in Australia.

Language as a barrier to disseminating information is highlighted by only 56% of the incoming passengers speaking English as their first language and 7% of passengers unable to understand any of the English verbal or printed material.

Under international health regulations the health authority of the departing port has to undertake all practicable measures to prevent departure of any infected person from a port or airport and the health authority can medically examine any person before they depart on an international journey.[3] There is no law stating the requirements of the arriving port to act to prevent spread of an infectious disease. However it is recommended by WHO that incoming passengers have information available if they become unwell in the arriving country. While the value of this recommendation should be evaluated it seems a reasonable strategy that arriving passengers be well informed of the symptoms of SARS and know how to seek medical advice if they become unwell. This audit shows that the border protection measures implemented in Australia with the current SARS outbreak may not be as effective as assumed.

Hopefully the proposed incoming passenger card[4] will strengthen communication about SARS to incoming passengers[#]. However, barriers such as language and understanding still need to be evaluated with any new border protection measures.

Acknowledgement and thanks to the CDC 'airport staff' who assisted with the audit. It should be noted that all flights arrived in Darwin between 0330 and 0630.

[#]From 16 June it became mandatory for all arriving passengers to complete a SARS Health Information Card - which includes a declaration of the passengers health, their recent travel history and contact details of the passenger while in Australia. The card also has specific SARS information for travellers, advice for health care workers about returning to work and advice to be presented by passengers to their doctors if they become unwell at a later date.

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Rheumatic fever and streptococcal pyoderma: searching for a link

Malcolm McDonald, Menzies School of Health Research, Rheumatic Fever Project

Introduction

In Aboriginal communities of Central and Northern Australia the incidence of acute rheumatic fever (ARF) and prevalence of rheumatic heart disease (RHD) remain among the highest reported in the world. By contrast the disease has all but disappeared from the non-Aboriginal people of Australia and other wealthy temperate climate countries.

There is a clear link between pharyngitis due to Group A beta-haemolytic streptococci (GAS) and ARF, at least in temperate climate counties where most of the research on ARF/RHD has been done. Recently another possibility has emerged. In communities with high rates of streptococcal pyoderma, low rates of pharyngitis and high rates of ARF/RHD, GAS strains originating in the skin may play a pathogenic role, either directly (skin infection directly leading to ARF) or indirectly. For example, GAS strains from skin lesions may infect the throat of the same individual or a contact, and then cause ARF. Alternatively, recurrent skin infections may 'prime' the immune response with subsequent development of ARF on further exposure to GAS (throat and possibly skin) . The question needs to be resolved as a matter of urgency because it would have immediate impact on prevention strategies and vaccine development. Current approaches to primary prevention of ARF/RHD in resource-poor settings and Aboriginal communities have clearly failed.

Another possibility is a pathogenic role for group C and G beta-haemolytic streptococci. Throat carriage rates of groups C and G are substantially higher than that of GAS in Aboriginal communities of the Top End. Groups C & G streptococci can cause invasive disease, post-infectious polyarthritis and pharyngitis; group C can cause glomerulonephritis and both may express M protein. There is also evidence for habitual gene transfer between both species and GAS. The evidence is tantalising and requires further investigation.

The aims:

- To undertake prospective surveillance of skin and throat infection and colonisation with streptococci in families of ARF/RHD patients in selected Aboriginal communities combined with active surveillance for ARF and molecular typing of streptococcal strains; to document the site and nature of streptococcal infection preceding ARF.
- To augment this information with a case-control study of streptococcal carriage in family members of people with ARF, looking for streptococcal strains strongly associated with ARF families.

The hypotheses:

- That GAS infection of the skin may precipitate ARF, or alternatively that:
- GAS organisms initially infecting the skin may subsequently be transferred to the throat and precipitate ARF, or alternatively that:
- Group C or Group G streptococcal infection, of the either skin or throat, may precipitate ARF.

Design and methodology

The project has two arms.

Community-based surveillance:

Surveillance will target households of people with a past history of ARF/ RHD. Once informed consent has been obtained, members of each participating household will have swabs taken from the throat and any skin sores every 4 weeks. There will be concurrent surveillance for ARF through collaborating community clinics. When cases of ARF do occur, streptococcal isolates recovered over the preceding 2 months will be characterised by molecular typing. Of course, any child or adult who has obviously infected skin lesions, pharyngitis or scabies at the time swabs are taken will be referred by

project staff to the clinic for appropriate treatment according to established protocols.

Hospital-based surveillance and case-control study:

Adults and children admitted to Royal Darwin Hospital with ARF will be approached for enrolment. Following informed consent, throat and skin swabs will be taken. Infecting streptococcal strains are often absent by the time ARF develops, thus we will then visit the home community of the patient to take throat and skin sore swabs from all household members within 7 days. With the assistance of health center staff and local council, we hope to identify 4 additional unrelated control households in the same community and take swabs in the same way. We will then look for unique features of any GAS strains found in case families and absent from control families.

The project is expected to get under way in July 2003 and extend for 2 years.

Potential outcomes and significance

Proof of the hypothesis that skin infection has a role in the pathogenesis of ARF would revolutionise our understanding of the disease. More practically, it would point the way for a new approach to primary prevention – the widespread use of skin infection control programs. It would also have major implications for GAS vaccine development, as most vaccines presently being developed are targeting GAS pharyngitis. In Aboriginal communities, it would lead to greater emphasis on skin sore, fungal skin disease and scabies control. Proof of a role for group C or G streptococci would be even more revolutionary. This project has the potential to rewrite the textbooks, or to confirm the existing dogma. Either way, it will have immediate impact on control efforts for ARF and RHD within Aboriginal communities, and perhaps globally.

Funding

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For more information contact Norma Benger (89227877) or Malcolm McDonald (89228197) at MSHR.

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Rheumatic Heart Disease Program
(Register, Treatment Guidelines and Priority Assessment)

Keith Edwards, CDC Darwin

Keeping the register up to date

The Rheumatic Heart Disease Register has proven to be the cornerstone of secondary prevention and reduction in morbidity/mortality in high-risk communities. All GPs, DMOs, visiting physicians and clinic managers are reminded how important it is to keep the Register up to date. Please contact Kay McGough (Telephone: 89228454 or Email: Kay.Mcgough@nt.gov.au) if you have any information that should be included. Your cooperation is most appreciated.

A recall list is sent to all medical staff and clinic managers every 4 months. Please use this list to arrange timely review by DMO, Physician / Paediatrician or Cardiologist as per the Priority Category (1, 2 or 3) of the client (see below). Whenever possible, the recall list should be faxed back to the Register with information on client compliance with secondary prophylaxis over the previous 4 months and any changes in client status or location.

Using IM Bicillin LA for secondary prevention of rheumatic fever

Secondary prevention of acute rheumatic fever (ARF) is based on IM Bicillin LA given every 3-4 weeks. It is clearly superior to oral penicillin (which is not recommended). Compliance with regular IM Bicillin LA is critical for prevention of further episodes of ARF. Some methods at improving compliance have included the following:

- A dedicated clinic staff member who manages the regular Bicillin injections and the recall list.
- Early notification to the Register when a client leaves the community
- Techniques to minimise the discomfort of Bicillin injections, e.g.:
  - ❑ Bicillin warmed to room temperature prior to injection
  - ❑ Lignocaine added to Bicillin and drawn into syringe last prior to injection.
  - ❑ Use of pressure at the injection site before injection
  - ❑ Priority service for Bicillin clients i.e. no waiting

We are in the process of collecting opinions on all methods to improve compliance with injections. Please help us by completing the questionnaire, if you receive one.

Admitting all patients with suspected acute rheumatic fever to hospital

Any adult or child with suspected ARF should be admitted to hospital immediately for investigation and cardiological assessment. Remember that arthritis (pain, heat, swelling) in one joint alone may be rheumatic fever. Use the protocol in the 4th CARPA Manual to help decide (see next page). If in doubt contact the DMO or Physician / Paediatrician

Avoiding aspirin prior to admission

If you believe a patient has ARF, there is no benefit in giving aspirin prior to hospitalisation. Response to aspirin can be a useful diagnostic indicator in hospitalised patients.

Taking throat swabs prior to admission

If a clinician believes a patient may have ARF it is important to take a throat swab prior to starting any antibiotics.

Assigning priority

Please note the new guidelines for assigning priority (p 15); this facilitates optimal patient management in a setting of limited resources.

CARPA Standard Treatment Manual
Rheumatic Fever[1]

Acute Rheumatic Fever (ARF) is common in this region and people continue to die from it or its late complications. It is most common in 5-15 yr olds, rarely in those more than 35 yrs or less than 4 years old.

A person with ARF may have any or all of the following:

- **Painful, swollen and tender joint or joints (arthritis), may move from one joint to another over days**
- **A single painful joint, which may be ARF**
- **New heart murmur**
- **Strange body movements that the person cannot control (chorea)**
- **Might have had this illness before**
- **Fever, unwell**
- **Shortness of breath and fast pulse (signs of heart failure)**
- **Skin rash and lumps under the skin (nodules) can sometimes happen**

- Also think about:

Is it joint or bone infection, or some other sort of arthritis?

Talk about any child with a painful swollen joint with a doctor.

If you think a person may have rheumatic fever

Talk with a doctor who should talk with a specialist to make a plan.

Do

- **swab of throat (MC&S)**
- **blood for ASOT, AntiDNAse B, C reactive protein, FBC, ESR, blood cultures**
- ECG
- Send to hospital straight away if signs of heart failure
- Otherwise send to hospital within 1 day
- People who only have mild chorea but are otherwise well still need to go to hospital for a check-up within a week.
- Treat fever and pain with **paracetamol**

Note: Aspirin and **penicillin** are not needed as urgent treatment and can make the final diagnosis in hospital more difficult. Part of the diagnosis for ARF is the effect of aspirin on the joint pains, which may be best observed in hospital.. If there will be delays in getting to hospital, discuss giving **Benzathine penicillin** (Bicillin LA) with a specialist.

Do not give aspirin to children under 12 years.

1. Central Australian Rural Practitioners Association, Alice Springs. CARPA Standard Treatment Manual. A clinic manual for primary health care practitioners in remote and rural communities in Central and Northern Australia, 4th ed. Central Australian Rural Practitioners Association; 2003; p 308.

Rheumatic Fever Registry
Guidelines for Assignation of Priority

Priority 1

Established RHD with:

- Any valvular lesion which is severe.
- Any valvular lesion which is moderate to severe where LV function is impaired OR where LV size is increased.
- Any valvular lesion which is moderate to severe where there is shortness of breath, tiredness, oedema, angina or syncope.
- All bio-prosthetic valves (porcine or homograft), and all valve repairs.

Management:

- Entered on the "NT Cardiac Priority List" Darwin, who coordinate management and decisions on valve surgery. Paediatric patients should be referred to the visiting paediatric cardiologists and closely followed by the specialist paediatrician.
- Also reviewed 6 monthly by specialist physician / paediatrician.

Priority 2

Established RHD with:

- Any valvular lesion which is moderate, providing there are no symptoms, and left ventricular function is normal.
- Metallic prosthetic valves once stable post surgery.
- Also children with a history of chorea should be in Priority 2 until 18 years old, even if there is no valve damage, as at least half of these will subsequently develop valve disease.

Management:

- Managed by GP/DMO, with review by specialist physician / paediatrician 12 monthly, or earlier if any clinical deterioration or within 3 months of hospital discharge following any episode of confirmed or suspected ARF.
- Usually need echocardiogram every 1 year (children) and 2 years (adults) to assess valve lesion severity and left ventricular function.

Priority 3

RHD or ARF:

- Any valvular lesion which is trivial to mild.
- ARF with no evidence of RHD.

Management:

- Managed by GP/DMO unless clinical deterioration, however children up to 18 years old should still be seen 12 monthly by the specialist physician / paediatrician.
- Usually need echocardiogram every 2 years (children) and 5 years (adults, no recent ARF).
- Any new diagnosis of ARF always requires specialist physician / paediatrician follow-up within 3 months of hospital discharge to assess progress.
- Specialist physician review before ceasing secondary prophylaxis.

NOTE: All cases of suspected or confirmed ARF should be admitted to hospital for diagnosis and management plan. **26/06/2003**

Immunisation Update

Christine Selvey, CDC Darwin

National Meningococcal C Vaccination Program

Meningococcal C (Men C) vaccine was introduced onto the NT Childhood Immunisation schedule in March this year. This vaccine is being funded by the Commonwealth Government and will be offered to all Australians aged 1-19 years over the next 4 years.

Meningococcal C vaccine should be administered at 12 months of age, at the same time as the 12 month MMR and Hib vaccines. In 2003, all children over 12 months of age and born in 1998 or later (ie turning 1 - 5 years in 2003) are eligible to receive a single dose of meningococcal C vaccine. This can be administered with other routine vaccinations at 18 months or 4 years, or can be given as a separate vaccination.

Senior high school students aged 15-19 years are also eligible for funded vaccine in 2003. High school vaccination programs for Years 10,11 and 12 have been completed in all the major urban areas except Darwin. School programs in Darwin high schools are planned for August and September. Coverage in schools so far has been high with up to 80% of eligible students vaccinated. Adolescents aged 15-19 years can also receive vaccination at community health centres so this should be offered opportunistically when adolescents come to the health centre and the immunisation reported to CDC.

Uptake of meningococcal C vaccine has been steady with 3,748 vaccines distributed in March and April. Meningococcal C vaccine for children born after 01/01/1998 down to 12 months of age who are not yet vaccinated will appear on community recall/reminder lists from July. Coverage data is not yet available.

Reports of adverse events following immunisation with meningococcal C vaccine have been few. All adverse events following any immunisation should be reported to CDC and can be discussed on the phone before reporting if required.

Childhood pneumococcal vaccination program

It is now 2 years since the 7-valent conjugate pneumococcal vaccine was introduced in the NT on 1 June 2001 for eligible neonates. The Catch-up component of the vaccination program began officially on 1 September 2001, with all Central Australian Aboriginal children up to 5 years of age and other eligible children up to 2 years of age being recommended for catch-up vaccination. Coverage has been high with over 90% of eligible children in all areas except Darwin Urban receiving their conjugate pneumococcal vaccinations at the same visit as their diphtheria-tetanus-pertussis-hepatitis B vaccinations. Data on conjugate pneumococcal vaccination coverage is currently being analysed.

NT ACIR immunisation coverage rates

Immunisation coverage for NT children, as estimated by the Australian Childhood Immunisation Register for the two most recent quarters is shown in Table 1. NT coverage rates for 30/06/2003 are the highest ever for the cohorts aged 12-<15 months and 24-<27 months. These coverage rates reflect the hard work of all NT immunisation providers and those involved with NT immunisation data, and indicate that NT children are well protected from vaccine preventable diseases. In particular, the data indicates that 97% of the 12 -<15 month cohort have had 3 doses of hepatitis B vaccine, and have completed a primary course of Hib vaccination. For the 24-<27 month cohort, 98% are fully vaccinated against hepatitis B and 96% have received a dose of MMR vaccine.

Table 1. Australian Childhood Immunisation Register – percentage of NT and Australian children who were fully immunised for age at 31/12/2002 and 31/03/2003 for cohorts aged 12-<15 months, 24-<27 months and 72-<75 months on 30/09/2002 and 31/12/2002 respectively.

Cohort	NT 31/03/2003	Aust 31/03/2003	NT 30/06/2003	Aust 30/06/2003
12-<15 months	**90.8%**	91.4%	**91.6%**	91.2%
24-<27 months	**87.0%**	89.0%	**89.0%**	89.3%
72-<75 months	**82.2%**	82.2%	**81.1%**	82.3%

In case you missed it - Updated NT TB Guidelines

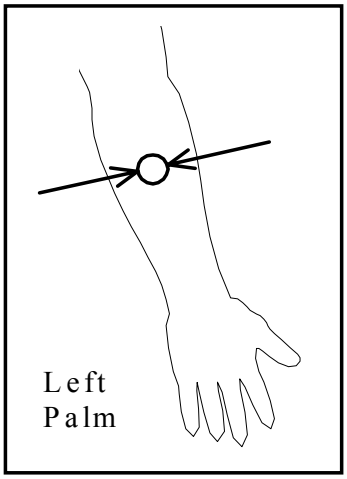
V Krause, CDC Darwin

What's new in this version of the guidelines

The last version of these guidelines was produced by the Northern Territory Centre for Disease Control in 1997. This 2002 edition has been updated to reflect more recent contributions to the field of TB control and also includes some changes to practice that have evolved through discussion amongst members of the NT TB Control Units and other interested parties. Major changes are summarised here and explained in detail throughout the chapters in the guidelines.

- **Mantoux readings should now be recorded as a single measurement taken as a lateral measurement across the forearm (Chapter 6).**

  The vast majority of literature on the use of Mantoux testing to identify infection with TB has been based on the size of skin induration present in a single reading taken from side-to-side (or "across") the forearm as a lateral measurement. There is very little in the literature to validate the reading of Mantoux tests in two axes, and that which is available suggests that the skin response to injection of tuberculin (PPD) may be longer than it is wide. The recommendation that Mantoux tests be read in a single axis perpendicular to the long axis of the forearm ensures consistency between the NT guidelines and those of other national and international TB control agencies.



- **The suggested Mantoux cut-offs for a test result indicative of TB infection in different age and risk groups have been modified (Chapter 6).**

  Minor changes to the recommended cut-offs have been made with the aim of ensuring those at highest risk of LTBI and progression to active TB are identified and offered treatment. The major change has been to suggest that BCG status be ignored when the underlying risk of LTBI or progression to active TB is high, given that there is no reliable method to distinguish Mantoux reactions caused by BCG from those caused by natural mycobacterial infections. Guidance in relation to interpretation of Mantoux tests in individuals of different ages, levels of risk and BCG status are presented here in table 1.

- **Two-step Mantoux testing (i.e., a first Mantoux test followed by a second Mantoux test after 1-3 weeks if the first is negative) is now routinely recommended as a baseline for staff expected to have follow up Mantoux testing as a result of an increased risk of exposure to TB through employment (Chapters 6 and 8).**

  The rationale for two-step testing is to minimise the number of staff who are offered treatment for LTBI as a result of reactive Mantoux testing during their employment. Two-step testing is used to detect the "booster effect" (i.e., reactivation of waned cellular immunity to tuberculin by an initially classified negative Mantoux test that on a second testing at any time from 1 week to 1 year later produces a greater, more accurate response). Boosting may occur in individuals with distant TB infection, past exposure to non-tuberculous mycobacteria or BCG vaccination.

  If a single Mantoux test is done as a baseline, it may be difficult to interpret whether an increase in reactivity on future testing represents recently acquired TB infection (for which treatment would be strongly

Table 1. Suggested cut-offs for interpreting Mantoux reactions

***Induration**†*	***Suggested Positive Mantoux Test Cut-offs***
≥ **5 mm**	All children under 5 yrs without BCG. Children under 5 yrs with BCG who are contacts of an infectious case or are from a high risk group‡. HIV-positive persons. Patients with organ transplants and other immunosuppressed patients (receiving equivalent of > 15mg/day prednisolone for > 2 wks).
≥ **10 mm**	Children under 5 yrs with BCG who are not contacts of an infectious case and are not from a high risk group‡. Adults and children over 5 yrs with no BCG. Adults and children with prior BCG who are contacts of an infectious case or are from a high risk group for LTBI‡.
≥ **15 mm**	Adults and children over 5 yrs with prior BCG who are not contacts of an infectious case and are not from a high risk group‡.

*Vesiculation, if present, is regarded as positive in all risk groups.

†For assessment of repeated testing of employees at increased risk of TB infection, see below.

‡High risk groups include those: likely to have been infected with TB within past 2 years (includes contacts of all ages); chest X-ray consistent with past inactive TB; other high risk medical conditions including diabetes, silicosis, chronic renal failure, carcinoma of head and neck, leukaemias, lymphoma and malnutrition.

recommended) or a boosted response from the first Mantoux test caused by distant past mycobacterial (TB or other) exposure. Therefore, two-step testing potentially offers individuals a more accurate baseline Mantoux result to compare with future testing, whether conducted as part of regular follow-up testing or after a potential TB exposure.

The two-step Mantoux is routinely offered for pre-employment testing of health care workers, staff of high risk workplaces (eg. Prisons, alcohol and drug rehabilitation centres and nursing homes) and chronic renal failure patients. It may also be useful for elderly or HIV-positive people and for selected individuals who have been BCG vaccinated.

- **The new terminology, "treatment of latent TB infection" (LTBI) has been introduced to replace "isoniazid preventive therapy" in most instances and diagnosing LTBI is seen as an intention to treat LTBI (Chapter 7).**

"Treatment of latent TB infection" more accurately describes why anti-TB medication is given to individuals in whom asymptomatic infection with TB has already been established. The terminology also reflects the fact that in some cases, treatment of LTBI might be given with drugs other than isoniazid. The term "preventive therapy" in relation to TB infection still has relevance where anti-TB medication is given to extremely high risk individuals (e.g., infants and people with HIV infection) soon after exposure to a case with active TB.

- **The preferred treatment regimen for treatment of LTBI with isoniazid has been increased in duration from 6 months to 9 months (Chapter 7).**

This recommendation follows a reinterpretation of the data which measures the benefit to individuals given a longer duration of isoniazid therapy in terms of efficacy in preventing new cases of active TB. From the best evidence available, it appears that 12 months of isoniazid is approximately

40% more efficacious in preventing active TB than is 6 months, and that nearly all of the benefit from the longer duration in therapy is attained by 9 months. It is considered prudent to offer individuals taking treatment for LTBI the most efficacious therapy available, recognising that substantial benefit will still be obtained after 6 months of good adherence to treatment in individuals unable to take medication for 9 months.

- **Rifampicin plus pyrazinamide taken daily or twice weekly for 2 months has been recognised as an alternative treatment regimen for LTBI in highly selected cases (Chapter 7).**

  This new regimen was initially greeted with enthusiasm by some authorities after efficacy equivalent to isoniazid was established in a number of large trials in HIV-positive subjects. Early experience with this regimen though in the U.S. has indicated higher rates of toxicity (including severe liver toxicity and death) than were anticipated. In the light of this experience, federal U.S. guidelines have recently been amended to urge caution in the use of this regimen, noting that:

  - Isoniazid for 9 months is the preferred treatment for LTBI.
  - Rifampicin-pyrazinamide may be considered when the completion of longer courses is unlikely AND when the patient can be monitored closely.
  - This regimen is not generally recommended in children.
  - This regimen should not be used in people with underlying liver disease or a history of isoniazid-related liver toxicity and should be used with caution in alcohol abusers and patients taking other hepatotoxic medications.
  - Patients should be reassessed in person by a health care provider at 2, 4, 6 and 8 weeks for adherence, tolerance and adverse effects.
  - Liver function tests and an FBE should be done at 2, 4 and 6 weeks of treatment in all patients on this regimen.

- **Routine screening of high risk groups e.g. chronic renal; failure and dialysis patients (Chapter 10)**

  A glomerular filtration rate (GFR) of 20mL/min signals a referral to the Renal Unit and also significant immunosuppression.

  Compared to active TB in the general population the relative risk (RR) of TB

  - is 37 in renal transplant patients.
  - is 10 to 25 in haemodialysis patients.

  For patients with a GFR of 20mL/minute it is recommended that:

  - Two step Mantoux test be used with a 5mm cut-off for renal transplant and a 10mm cut-off for other renal patients.
  - Mantoux positive patients be referred to the TB unit for clinical review and chest X-ray.
  - Mantoux negative patients with evidence of past or present TB infection on chest X-ray should also be referred to the TB unit for review.

  Renal patients eligible for LTBI treatment should receive 9 months of 3 x weekly supervised INH.

Guidelines are available on-line at URL: http://www.nt.gov.au/health/cdc/protocols.shtml

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Fact sheet

Two-step Mantoux testing for high risk groups

The Mantoux test

A Mantoux test is a simple and safe test. A small amount of Tuberculin is injected just under the top layer of skin on a person's arm using a small sterile needle and syringe. Two to 3 days later the skin reaction (lump) is measured and the result recorded.

Boosted reactions and two-step skin testing

Two-step testing is given to detect individuals previously infected or vaccinated with BCG who may test negative to tuberculin testing initially, but who show a strong reaction to tuberculin if the same procedure is repeated 1 to 2 weeks later. The two-step test is important to establish the true baseline reaction when further tuberculin testing is required as part of contact tracing or monitoring of high risk groups.[1]

The 'booster effect' represents bolstering of waned cellular immunity by an initial negative Mantoux test such that a second test at any time from 1 week to 1 year later produces a greater, more accurate response. This effect will only be observed in individuals with prior cellular immunity to PPD (whether from *Mycobacterium tuberculosis*, BCG or nontuberculous mycobacteria) and is more common in the elderly (age > 55 years). Because the proteins in PPD are small in size, repeated skin testing with standard doses of tuberculin will not induce a positive skin test reaction in individuals who have no cellular immunity to the antigens in PPD.

'Two-step' testing is used to avoid interpreting the effect of boosting as a new infection. If the first test is < 10mm (and no Mantoux has been done in the previous 12 months), it is repeated 1-3 weeks later and the second test is interpreted as measuring the true degree of reactivity.

Possible side effects

Side effects are uncommon. However, a person who has been exposed to TB germs may occasionally have a sizeable reaction, which may cause some discomfort. This swelling should disappear in about 2 weeks.

Who needs a two-step skin test?

- People who have chronic renal insufficiency
- People who have lowered immunity such as HIV infection or certain medical conditions
- The elderly who are entering care facilities
- Baseline two-step testing should be *routinely* offered for pre-employment testing of health care workers e.g. hospital and community health and staff of high risk workplaces (e.g. prisons, alcohol and drug rehab. centres and nursing homes)
- People about to undergo organ donation

What happens after the Mantoux test is read?

If the test is negative, it is recommended that you undergo yearly or second yearly Mantoux testing.

If the test is positive, a chest X-ray and physical examination will be needed to ensure there is no sign of active disease. If there are no signs of active TB the doctor will discuss the possibility of taking medication to prevent the development of TB disease. The benefits of taking the medication depend on the person's age, health and underlying risk of TB disease.

Ongoing screening of employees at increased risk of TB

A baseline two-step Mantoux test will make subsequent Mantoux testing much easier to interpret and minimise the chance that people will be inappropriately diagnosed and unnecessarily given treatment for latent tuberculosis infection (LTBI). Because there is biological variation and unavoidable differences in even the most carefully performed tests, small increases in reaction size on post-employment testing may not be meaningful. Therefore, for persons with Mantoux tests regarded as not indicating LTBI initially, an increase in reaction size of less than 10 mm within a period of 2 years should not generally be regarded as evidence of recent infection with TB. In selected circumstances, increases in reaction size of 6-10 mm within 2 years in people at particularly high risk may warrant consideration of treatment for LTBI. If in doubt, these people should be referred to the TB Control Unit for individualised assessment. Requirements for screening of health care workers and other at-risk staff are outlined further in the "*Guidelines for the Control of Tuberculosis in the Northern Territory*".

What does a positive test mean?

It means that the person is infected by TB germs, but does not mean that he or she has TB disease. This person cannot pass TB onto anyone else unless they get active TB.

How can a person be infected and not have TB disease?

After TB germs enter the body, in most cases, body defences control the germs by building a wall around them, the way a scab forms over a cut. The germs can stay alive inside these walls for years in an "inactive" state. While TB germs are inactive, they cannot harm the person and *they cannot spread to other people*. The person is infected but not sick and is unlikely to be aware that he or she is infected.

1. Draft - 8th Edition Australian Immunisation Handbook. October 2002, ATAGI,

Mantoux screening for Health staff and those in designated risk groups
• **Initial Mantoux ≥ 10mm refer to p 78 TB Guidelines**
• **Initial Mantoux < 10mm (no previous Mantoux within the last 12 months)**
► Repeat Mantoux in 2 — 3 weeks
► Second Mantoux < 10mm repeat 1 — 2 yearly
► Second Mantoux ≥ 10mm refer to p 78 TB Guidelines

For further information contact the TB Clinic in your region:

Alice Springs: 8951 7548
Darwin: 8922 8806
Katherine: 8973 9049
Nhulunbuy: 8987 0282
Tennant Creek: 8962 4259

Further fact sheets and treatment protocols are available at http://www.nt/gov.au/health/cdc

CDC and NHMRC Policies, Protocols and Guidelines

Available on the DHCS Intranet Site (under Public Health/Disease Control/Guidelines & Protocols) or DHCS Internet site at http://www.nt.gov.au/health/cdc/protocols.shtml or by contacting your regional CDC

Policies, protocols & guidelines
Acute post streptococcal glomerulonephritis Guidelines for the control of acute post-streptococcal glomerulonephritis (December 2002)
Anaphylaxis Management of anaphylaxis in the urban setting (March 2000) Management of anaphylaxis in the rural setting (March 2000)
Communicable Disease Surveillance in the NT Guidelines for the reporting of notifiable conditions (February 2000) Notifiable conditions to be reported by all clinicians in the NT (March 2000) - WALL CHART Notifiable conditions to be reported by all laboratories in the NT (March 2000) - WALL CHART
Diphtheria Guidelines for the control of diphtheria in the NT (May 2003) Currently being reprinted
Exclusion periods 'Time Out' – Recommended minimum periods of exclusion from school, pre-school and child care facilities for children or staff with, or exposed to, infectious diseases (March 1999) – WALL CHART
Gonococcal conjunctivitis Guidelines for the control of gonococcal conjunctivitis (January 2003)
Hepatitis A NT Hepatitis A vaccination policy and public health management guidelines (February 2000)
Hepatitis B NT Hepatitis B vaccination policy and public health management guidelines (June 2000)
Invasive haemophilus influenzae type b infections Refer to relevant section in the current edition of *The Australian Immunisation Handbook* (NHMRC)
Leprosy Guidelines for the Control of Leprosy in the NT (October 2002)
Lyssavirus - FLOW CHART Australian bat lyssavirus post-exposure prophylaxis (PEP) - (April 2000)
Malaria Guidelines for health professionals in the NT - 3rd edition (January 1997) Revision and review of NT protocol (memorandum dated 7 October 1999) Currently under revision
Measles Communicable Diseases Network Australia New Zealand: Technical Report Series No 5 Guidelines for the control of measles outbreaks in Australia (July 2000) http://www.health.gov.au/pubhlth/immunise/measles.htm
Meningococcal disease Guidelines for meningococcal meningitis/septicaemia chemoprophylaxis (December 1997) NHMRC - Guidelines for the control of meningococcal disease in Australia (October 1996) http://www.health.gov.au/pubhlth/cdi/pubs/mening.htm
Outbreak management A framework for investigating outbreaks in the Northern Territory (May 2000)
Pertussis Communicable Diseases Network Australia New Zealand: Technical Report Series No 1 Guidelines for the control of pertussis in Australia (November 1997) http://www.health.gov.au/pubhlth/strateg/communic/tech/pertus.htm
Scabies Healthy Skin Program - Guidelines for Community Control of Scabies and Skin Sores and Crusted Scabies in the NT (February 2003)
Trachoma Guidelines for treatment of trachoma in the NT (1998)
Tuberculosis Guidelines for the control of tuberculosis in the NT (December 2002)
Vaccination Schedules Northern Territory Standard Childhood Vaccination Schedule, 1/3/03 Northern Territory Adult and Special Groups Vaccination Schedule 1/3/03

Mycobacterium bovis in the Northern Territory

Karalyn Kalemba, CDC Darwin

In 2002 14 cases of *Mycobacterium bovis (M. bovis)* were detected in the Northern Territory among buffalo near the Adelaide River. These were the only cases detected in Australia. Initially 4 buffalo on one property were detected with *M. bovis.* Testing of the surrounding property resulted in the detection of 10 further cases. All buffalo, and some cattle, associated with the affected buffalo were culled. In 2001 only one case was detected in Australia (Queensland) and in 2000 no cases were detected. Human notifications of *M. bovis* in the Northern Territory remain low. Most cases have been in older adults with past occupations associated with the cattle industry. They were probably infected earlier when the prevalence of disease amongst cattle was much higher, i.e. before or in the early years of the Brucellosis and Tuberculosis Eradication Campaign (BTEC) of 1980 to 1992.

Notification date	Age at notification	Gender	Residence	Ethnicity
Oct-96	59	F	Bulman	Aboriginal
Mar-90	55	F	Barunga	Aboriginal
Dec-99	45	M	Ali Curung	Aboriginal
Jan-00	45	M	Darwin	Aboriginal
Oct-02	54	M	Darwin	Non-Aboriginal

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Letter to the Editor

Dear Dr,

RE: *Mycobacteria in the Northern Territory*, page 14, Vol. 10, No. 1, March 2003.NT Disease Control Bulletin.

Thank you for publishing this concise but comprehensive article. Readers should note that molecular diagnostic facilities for mycobacteria do not exist in the NT yet. Because of a range of issues, referrals for nucleic acid amplification and nucleic acid probe assays require authorisation from a clinical microbiologist. This means the turn-around times quoted should be extended by up to a week depending on the day of referral. The bottled media mentioned for culturing blood for MAC is called "MycoF". This media can be ordered from stores (catalog number MEDIA 004) and is not distributed by the Microbiology Laboratory. Scientific and medical staff from the Pathology Department are always happy to provide advice in terms of diagnosis of mycobacterial disease. The value of anatomical pathology and microbiology in the diagnosis of mycobacterial disease cannot be overestimated.

Yours sincerely

Gary

Dr Gary Lum
Supervising Pathologist, Dept Health & Community Services
Director of Pathology, Royal Darwin Hospital
Contact details @ http://gazpath.com

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nPEP – for when the condom really does break!

Peter Knibbs, Deidre Ballinger and Jan Savage, AIDS STD Program, CDC Darwin

Introduction

Non occupational Post Exposure Prophylaxis (nPEP) is a course of anti-Human Immunodeficiency Virus (HIV) medication that is indicated when a person has been potentially exposed to the virus through unprotected sexual contact, injecting drug use or trauma such as physical assault. Risk of transmission is assessed according to the nature of the exposure, infectivity of the source (if known) and host susceptibility. To be effective, prophylactic medication should be taken as soon as possible after an exposure and no later than 72 hours. The AIDS/STD program is aiming to increase client accessibility to nPEP through supporting Emergency Departments (ED) in the Northern Territory (NT) to implement national guidelines.

Background

Post Exposure Prophylaxis (PEP) has been used in the health care setting since 1988 to help prevent infection after an exposure to HIV infected, or potentially infected, blood or body fluid. It involves the exposed person taking antiretroviral medication until the status of the index person is determined, or for 4 weeks if the person is known, or determined to be, HIV positive. The data in support of PEP includes a case-controlled study of health care workers which reported a 79% reduction in the risk of seroconversion using monotherapy zidovudine (AZT)[1], animal studies[2] and randomised controlled trials which demonstrated reduction in perinatal transmission using antiretroviral treatment.[3] HIV treatment trials[4] have demonstrated a clinical benefit in terms of viral suppression and immunological function using a combination of antiretrovirals, usually a minimum of 3 drugs, and is now the standard of care in managing HIV infection. Combination prophylaxis using a two or three drug regimen has also been adopted for PEP.

nPEP in Australia

Discussion for using PEP for non-occupational exposure to HIV had been on the public health agenda for some time. Obstacles to its implementation were primarily based on the cost of medication and who would bear this ($700 + per patient), and concerns that PEP may be perceived as some sort of "morning after pill" leading to an increase in unsafe sexual practices. The public health benefits of potentially preventing new cases of HIV, with the associated lifetime cost of treatment, was eventually considered to outweigh or counterbalance, the cost of implementing nPEP. In July 2001, commissioned by ANCAHRD (Australian National Council on AIDS, Hepatitis C and Related Diseases) the Australian Society for HIV Medicine (ASHM), released national guidelines for the management of nPEP.[5]

To assist clinicians in deciding if offering nPEP is appropriate, the national guidelines clearly outline conditions for assessment. These include;

- risk of exposure,
- HIV status of source individual and
- timeliness of presentation (within 72 hours).

Risk of acquiring HIV from a single exposure is assessed according to the known, estimated risk carried by a single exposure to HIV (see Table 1) multiplied by the risk that the source person is HIV positive (if that is not known). If the HIV status of the source person is not known, seroprevalence within the relevant population group of Australia is used for the purpose of risk assessment (see Table 2). Cofactors specific to the exposure, which may increase the risk of transmission include:

- a high plasma viral load of the source person (if known HIV positive),
- the presence of a sexually transmitted infection (in either exposed or source person),
- mucosal disease where oral sex was the exposure,
- type of needle and presence of blood if the exposure was needlestick.[5]

Table 1. The risk of HIV transmission following a single exposure to a known HIV positive source[5]

Type of Exposure	Estimated risk HIV transmission per exposure
Receptive anal intercourse	3.0% (1/125 to 1/31)
Receptive vaginal intercourse	0.1% (1/2000 to 1/667)
Insertive vaginal or anal intercourse	0.1% (1/3333 to 1/1111)
Needle stick injury	~ 0.3% (1/313)
Use of contaminated injecting drug equipment	~ 0.6% (1/149)
Mucous membrane exposure	~ 0.1% (1/1111)

Table 2. HIV seroprevalence in Australia by community group[5]

Community group	HIV seroprevalence
Homosexual men	3 – 15%
Injecting drug users • Homosexual • All others	 17% 1%
Heterosexuals • Blood donors • STD clinic attendees	 0.0005% 0.1%

Since the introduction of nPEP in NSW in 1998, an ongoing observational study to monitor its use and effectiveness has been conducted by the National Centre in HIV Epidemiology and Clinical Research (NCHECR). This study has expanded to include enrolments from the other Australian states and as of June 2002, a total of 680 patients had been enrolled from NSW, QLD, ACT and VIC. Importantly, there have been no seroconversions in this group which can be attributed to the failure of nPEP.

To date, concerns over a rise in unsafe sexual behaviour in response to the availability of nPEP have not been realised and the NCHECR study has found very few repeat presenters for nPEP. There are also common anecdotal reports that being on antiretrovirals for 4 weeks gives the individual a greater appreciation and understanding of what having HIV is like. In terms of access to treatment, it is of note that 41.6% (283 of 680) of those in the NCHECR nPEP study had their initial assessment through an ED and data from St Vincent's Hospital in Sydney suggest that 58% of actual or potential HIV exposures occur on a weekend.

nPEP in the NT

While PEP for occupational exposure to HIV has been available at hospitals in the NT for a number of years, nPEP has only been regularly available through specialised services such as Clinic 34 and the Sexual Assault Referral Centre (SARC). With the release of the ANCAHRD National Guidelines it was a priority of the AIDS/STD Program to make nPEP more universally and uniformly available throughout the NT. This includes facilitation of access to nPEP that is not restricted by regular working hours (i.e. 8.00am and 4.21pm, Monday to Friday). To this end, the Director of the Royal Darwin Hospital (RDH) ED has agreed to adopt the National Guidelines. A simplified two-page

summary and nPEP algorithm has been developed to assist ED staff to assess and manage clients who present. This information will be included in the RDH ED website for access by staff in smaller centres and the ED senior staff is available to assist with enquiries about nPEP after hours. AIDS/STD Program staff in each health district are available to support the service and address some potential barriers to effective nPEP supply through an emergency department, such as familiarisation with the process, risk assessment skills and prescription advice.

There are no current plans to make nPEP widely available to small remote communities due to the current low demand and limited shelf life of the medication. Individuals who are assessed as needing nPEP would be managed on a case by case basis with advice from the AIDS/STD program or hospital staff.

For questions or concerns over nPEP, please telephone Peter Knibbs at Clinic 34 in Darwin on 89 228007. For copies of the ANCAHRD guidelines visit http://www.ancahrd.org

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Report on the 2nd Incarceration Conference of the Public Health Association of Australia, Brisbane, 2-3 April 2003

Nathan Zweck, CDC Darwin

The first Public Health Association (PHA) Incarceration Conference in 1999 focused on the health of prison inmates. Events of the intervening years determined a broadened scope for this conference which included the health of asylum seekers in long-term detention.

Most people I spoke with over coffee considered the major prison-specific health problems in Australia and New Zealand were mental health and Hepatitis C. Chris Puplick of the NSW Anti-Discrimination Board and Australian National Council on AIDS, Hepatitis C and related diseases, asserted that "the greatest challenge is the provision of adequate mental health care to prisoners" with 30% of male and 50% of female inmates having had contact with community mental health services in the 6 months prior to incarceration. It seems so obvious but requires constant restating that the most effective way to ameliorate these problems in prison is to reduce the rates of incarceration itself. Law reform is outside the direct control of the health profession, and it is apposite that lawyers, custodial commissioners, and politicians were among the invited speakers. Professor David Brown of the Law Faculty, UNSW, highlighted the political interests which can be served by high rates of incarceration. It was noted that 31% of black men in the USA are currently

disenfranchised (denied the vote) since they have committed a felony. In Florida this persists after release and lifelong, amounting to a permanent racially-weighted gerrymander. If anyone left this conference without knowing that Aboriginal men are incarcerated at 15 times the rate of other Australians, they weren't listening. The statistic was related in at least 5 presentations I witnessed. Referring to the disproportionate incarceration of Indigenous Australians, NSW Magistrate Dr Pat O'Shane quipped, "the definition of lunacy is doing the same thing over and over and expecting different outcomes".

The last invited speaker left the conference on a hopeful note regarding incarceration rates. Danny Cloghan, the Chief of Staff of the Attorney General of WA, described how a raft of new initiatives introduced by the Labor government since February 2001 reduced the overall rate of incarceration by 7%, and the female rate by 19% between the 2000/01 and 2001/02 financial years. This was achieved when all other jurisdictions except the NT and ACT recorded increased rates, with rates increasing overall in Australia in the past 10 years by one-third. During the same period the Indigenous incarceration rate in WA fell 14%, sorely needed in the state with the highest rate in 2001/02 of 2669/100,000. Cloghan's repartee to O'Shane was an amended definition of lunacy: "doing the same thing over and over and knowing the outcomes!" In recent months there has been a reversal of the encouraging trends in WA. "Perhaps some are taking the foot off the pedal"; he mused in regard to administrative procedures such as ensuring that the increased rate of early release is maintained (at the date of earliest release possible). Proposed legislative measures include the prohibition of sentences of less than 6 months duration in favour of community based orders. "Short sentences serve no purpose except to enhance a career in crime", Cloghan said.

The mood was that 'corrections health' ought to be in the purview of government departments of health (as in NSW) rather than departments of correction. Ownership of inmate medical records by correctional services allows the potential for the knowledge of a medical condition to lead to discriminatory treatment of an inmate.

Although NSW and Victoria have performed recent prisoner health surveys, and Queensland a female survey, there is an urgent need for a standardised national approach for data collection and analysis. An entire proffered papers session was devoted to discussion of the issues surrounding a proposed national survey in 2006. One delegate remarked that "we need to know more than the prevalence of something to do something about it". Without such baselines however, objectives cannot be set, nor awareness raised. Strategies to achieve the objective of reduced transmission for a disease such as Hepatitis C have been validated in communities outside prisons (needle and syringe programs or NSP for example), and the wheel need not necessarily be re-invented by requiring proof of their efficacy inside prisons before implementing them. The political will does not currently exist for all prisons to employ methadone maintenance programs to reduce the *amount* of intravenous drug use (IDU) in prisons, nor the provision of bleach, needles, and syringes to reduce the *risk* of IDU in prisons (some states provide bleach, no states have NSP currently). Another definition of lunacy perhaps: "We know the desired outcomes, but refuse, over and over, to implement the actions to achieve those outcomes".

While known prevalences of HCV in Australian prisons range from 13% in Tasmania, to 40% for NSW men, and 60% for NSW women, John Kaldor highlighted the difficulty of establishing associations and risk factors for the *incidence* of HCV in prisons. The small number of incident cases during incarceration in multiple studies around the world so far (eg. 1 or 2 cases after hundreds of person-years of observation) means that statistically significant conclusions are still awaited. Underpowered studies in Australian states could be overcome by interstate or international collaborations, and specifically the possibility of working with international researcher and biostatistician Dr Sheila Bird. Her Scottish data show that drug-related deaths in adult male IDUs are 7 times higher in the fortnight after release from prison than any other time. The hypothesis is that IDU continues in prison but at a lower intensity - the resultant loss of tolerance increases the risk of overdose soon after release. Intravenous naloxone could be

provided to users post-discharge for administration by their friends if an overdose situation arose. A medical parallel is the carriage of parenteral adrenaline by persons whose life is threatened by bee-stings. However, assuming naloxone prevents mortality with an efficacy of 50%, 16,000 subjects would be required to adequately power a randomised controlled trial, achievable only with multi-centre involvement. Sheila Bird also emphasized the inefficiency of random mandatory opiate testing of inmates to ascertain whether or not IDU was occurring in a prison. Assuming an average rate of 6 injections every 4 weeks, and knowing that heroin is detectable in urine for 3 days after use, means that random screening will only detect usage two-thirds of the time (18 days of 28). Health policy based on this process will underestimate the potential for transmission and allow risk minimisation initiatives to be ignored.

Dr Sev Ovsdowski (Human Rights Commissioner), Paris Aristotle (Victorian Foundation for the Survivors of Torture and Trauma) and Dr Aamer Sultan (detained for 3 years in Villawood) spoke eloquently about the deleterious effects of indefinite mandatory detention of asylum seekers, and the temporary protection visa. A most powerful testimony came from Professor Richard Harding, the Inspector of Custodial Services in WA, who has intimate knowledge of the conditions inside every prison in that state, and 33 years of involvement in corrections policy and research. Of his visit to the Curtin Immigration Reception and Processing Centre (or "Detention Centre") in 2001 he remarked, "when I became aware of the conditions in detention centres I realised that conditions in prisons are pretty good by comparison". In another forum following riots at Curtin in 2002 he has been quoted, "if the conditions that you have seen in Curtin and Woomera and some of the other detention centres were replicated in an Australian jail, they would be ungovernable. Red-blooded Australian prisoners would simply not put up with what we are doing to people who have not been convicted of anything".[1] Whilst prison systems in Australia are "mature and improving", detention centres he believes are an immature model with low levels of accountability by ACM and DIMIA, and existing standards which are "fluffy, woolly, abstract, and useless". Medical staff employed by ACM are subject to extreme professional and ethical dilemmas and he concluded, "When custodial culture dominates medical culture, deleterious health outcomes are the result".

The NT was well represented with presentations and posters given by Chris Wake, Christopher Judkins, and Bronwyn Wake, of Corrections Medical Services (the prison health contractor for the NT). From CDC, Jan Savage and Deidre Ballinger were co-authors of a paper on Gonorrhoea and Chlamydia screening in NT Prisons, 2001-2002, and Nathan Zweck presented the experience of TB control in the Darwin Correctional Centre, 1999-2002. The NT will maintain contact with other jurisdictions through monthly teleconferences with the Australian Council of Prison Health Services as momentum builds to a National Prisoner Health Survey in 2006 and a 3rd PHA Incarceration Conference in 2007.

Rapporteur Dr Michael Levy of the NSW Correctional Health Services concluded that "Aboriginal incarceration is our national shame" but, "for the first time we have a clue about how to keep Aborigines out of prison". Will other states learn administrative and legislative lessons from the WA experience to make inroads into the highest Indigenous imprisonment rate of any OECD# country? Will serious drug reform in the community diminish the use of short sentences for drug-related crime, and lessen recruitment of non-users to unsafe intravenous drug-use in prison? Or will lunacy prevail?

Organisation for Economic Co-Operation Development

Reference

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Exotic mosquitoes detected in cargo at East Arm Port area 19 March 2003

Peter Whelan[1], Gisela Lamche[1], Craig Prosser[2] and Hugo Espinoza[2]
[1]Medical Entomology Branch, Health and Community Services
[2] Australian Quarantine Inspection Service Darwin
21 March 2003.

The Northern Territory Department of Health and Community Services (DHCS) and the Australian Quarantine Inspection Service (AQIS) have released details of the interception of a high-risk importation of exotic Asian tiger mosquitoes in cargo unloaded at the East Arm port facilities in Darwin in the Northern Territory. Eradication and follow up surveillance operations have started and it is expected the importation of these high risk Asian tiger mosquitoes will be eradicated. This has been a great example of the thoroughness of AQIS inspection and reaction procedures in both Western Australia and Darwin, and the continuing local cooperative programs between AQIS and DHCS.

The importation occurred in a large wooden crate of pipes wrapped in clear plastic offloaded from a general cargo vessel, which arrived in Darwin 18/3/03 ex Dampier WA 15/3/03 and ex Singapore 8/3/03. The cargo was in a lower hold that could not be inspected in Dampier, but was flagged in Dampier as posing a possible quarantine risk because of the observation of possible water on the plastic sheeting. An AQIS officer in Darwin detected the importation of live larval mosquitoes in rain filled depressions in the plastic from the just offloaded cargo on the morning 19/3/2003.

The AQIS officers collected all the larvae and pupae in the original water, and submitted them to the Medical Entomology Branch (MEB) of DHCS. Treatment of the plastic wrapping and water on the cargo was undertaken with aerosol cans of knockdown insecticide soon after the detection. This was followed by complete fumigation of the cargo with methyl bromide.

All larvae were identified as *Aedes albopictus.* The larvae were a mixture of the 4 growth stages and, 3 live and 1 dead pupae, and 5 empty pupal skins. The pupae recovered were bred out under isolation facilities at MEB included a male and female *Aedes albopictus*.
This species is a vector of the arbovirus diseases Dengue and Chikungunya. The detection of live pupae and empty pupal skins indicated there was a high possibility of live adult mosquitoes flying from the hold and live eggs on the plastic wrapping. Stevedores in Darwin reported the presence of live adults flying in the hold. The live adults indicated a high risk for adults to fly onshore and to establish in Darwin. The presence of live adults on arrival in Darwin raised the possibility that live adults may have been present in Dampier and eggs or larvae may have been present on other cargo off-loaded in Dampier.

A coordinated response between DHCS and AQIS was carried out immediately after the detection according to recently established procedures developed by the National Arbovirus and Malaria Advisory Committee. The Commonwealth Health authorities, WA Health and AQIS authorities were notified on the day of detection. The vessel agents in Darwin were requested to close the vessel overnight and the hold of the vessel was fogged internally by a private pest control company using pestigas (pyrethroids, allethrin and pyrethrum). The crates of cargo were covered by a tarpaulin and treated with methyl bromide on the 21/3/2003. The Shire of Roebourne in Dampier undertook fogging of the port area on 19/3/03 and off-loaded cargo was also inspected and fogged. Adult mosquito traps and ovitraps have been installed in Dampier port areas for ongoing surveillance.

The immediate East Arm Port facilities and the surrounding area was fogged by heavy-duty ultra low volume insecticide application of bioresmethrin on the evening of 19/3/03.

Increased surveillance was put in place both inside and outside the 400m-quarantine zone around the port facility. AQIS placed 3 mosquito ovitraps in the port facility in addition to 3 routine ovitraps. DHCS placed 3 additional ovitraps outside the 400m zone in the approach area to the port facilities and 2 in near by premises where cargo from the vessel was

delivered. All ovitraps were monitored weekly for the next 4 weeks for the presence of exotic mosquitoes. Three carbon dioxide baited adult mosquito traps were operated daily by AQIS at the port facilities and DHCS in the adjacent area for the next week. Receptacle inspection and treatment in the area were carried out as a continuing operation.

The increased surveillance in NT and WA failed to detect any further specimens of *Aedes albopictus*, indicating that the importation has been eliminated.

The presence of 4th instar larvae, pupae and pupal skins of *Aedes albopictus* indicated that at least the eggs and possibly the larvae were present on the plastic wrap in Singapore before it embarked to Dampier and Darwin.

This is the 5th risk situation involving *Aedes albopictus* in the Darwin area in the last 3 years and the second risk situation involving clear plastic wrapping serving as a breeding site for exotic *Aedes* mosquitoes in the same period. This detection indicates that clear plastic wrapping of cargo exposed to rain requires increased surveillance at first ports of call of overseas vessels arriving in Australia. It also indicates a need for guidelines on the use of plastic wrapping to prevent future incidents.

The latest detection is an illustration of the excellent inspection procedures by AQIS officers and the well-coordinated and cooperative response between AQIS and DHCS staff. The NT has been free of the *Aedes* vectors of dengue since the late 1950's, despite many instances of importations. This continued absence is due to the vigilance of local quarantine officers and speedy elimination measures. This interception will ensure the NT remains free of dengue vectors and Australia remains free of *Aedes albopictus*.

Acknowledgments

Special acknowledgment is given to AQIS staff Mr Olaf Sjerp inspector in Dampier, John Sicari senior inspector in Karratha, Mr Neil Brogan operations manager in Perth and Ms Sui Ying Soong inspector in Darwin, for their vigilance in spotting the incursion and their speedy reaction in organising information and response actions. Ms Sue Harrington of WA Health facilitated response actions in WA. Thanks are also given to Ms Jane Carter, Ms Jennifer Grigg and Ms Leah Stratford of the Medical Entomology Branch, for speedy insecticide fogging operations and the increased surveillance measures. Acknowledgment is also given to Mr Graham Goodwin and other AQIS staff in Darwin for ensuring speedy incursion reaction and follow up surveillance procedures.

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Editorial Comment

Early detection of the Asian tiger mosquitoes, *Aedes albopictus,* which have the potential to transmit dengue fever and chikungunya disease, has led to a successful eradication operation.

The *Aedes albopictus* were found by AQIS quarantine officers at a Darwin port facility in water on a plastic cargo cover, which was shipped from Singapore in mid March 2003.

This importation follows an outbreak of dengue fever in far north Queensland. Dengue fever in Queensland is spread by the other main type of dengue carrying mosquito, *Aedes aegypti*, which has so far affected more than 400 people in Cairns.

The Department of Health and Community Services (DHCS) medical entomology surveillance has detected 5 incursions of these exotic mosquitoes in Darwin in the past 3 years.

If established in Darwin, the *Aedes albopictus* would enable transmission of dengue from imported cases coming in from nearby countries such as East Timor. The NT remains free of both dengue vectors, and *Aedes albopictus* are not found anywhere in Australia.

Aedes aegypti mosquitoes inhabited Darwin during World War II, but were eradicated in the mid 1950s. Quarantine and DHCS inspections and surveillance measures are in place for early

detection and prevention of re-establishment of these mosquitoes. Adult mosquito traps and special egg traps are operated by AQIS and the Medical Entomology Unit of DHCS for ongoing surveillance in port, airport and suburban areas in Darwin, Nhulunbuy and Groote Eylandt.

Aedes albopictus can breed in natural and artificial water filled receptacles, in contrast to *Aedes aegypti,* whose breeding is confined to artificial receptacles. *Aedes albopictus* can also spread to temperate areas and could establish away from towns in areas of dense forest. Thus *Aedes albopictus,* once established in Australia, would be harder to control and eradicate.

This interception has ensured that the NT currently remains free of dengue vectors, and Australia remains free of *Aedes albopictus*.

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NT Tobacco Control Act 2002

Alcohol and Other Drugs Program

After 4 years of being branded the 'Dirty Ashtray Award' winner, the NT has this year taken out Australia's top honour for efforts to control tobacco use.

The Australian Medical Association (AMA) and the Australian Council on Smoking and Health (ACOSH) named the NT the Highest Achiever in the 2003 National Tobacco Scorecard on May 30, just in time for World No Tobacco Day on May 31.

The scoreboard is an annual award to promote best practice in tobacco control in Australia.

In announcing the award, AMA and ACOSH commended the NT for its "guts and determination" in making significant changes to major components of the tobacco control legislation and introducing the Tobacco Control Act 2002.

Aspects of the new Act relating to smoke-free dining and shopping came into effect from 1st January. From 31st May

- workplaces are 'smoke-free';
- licensed premises must offer equal amenity in all areas; and
- retailers must comply with new restrictions on advertising and display of tobacco products.

In handing down the award, AMA and ACOSH announced the following:

"Coming from the bottom of the pile last year, and hailed as the 'Most Promising Performer', it has managed to outperform all other States in 2002/03 and is propelled to the top of this year's Scorecard.

"Overall, the legislation is a quantum leap for the Northern Territory and the NT Government should be congratulated."

The Minister for Health and Community Services, Jane Aagaard, said the award recognised the Government's commitment to reduce levels of smoking and improve the health of Territorians.

"The Tobacco Control Act 2002 is one of the most significant initiatives for health in the Northern Territory during the last decade," Mrs Aagaard said.

"Through effective collaboration with all stakeholders - including industry associations, retailers, hoteliers and business - we have been able to implement legislation focused on improving the health and well-being of all Territorians.

"The Act brings us into line with other Australian States and Territories in terms of discouraging people from smoking, reducing exposure to environmental tobacco smoke, and supporting people in their efforts to quit smoking.

"It's long been recognised by this Government that Territorians deserve the same health protection as other Australians, and we intend to provide that protection."

Fact Sheet

Fifth Disease (Erythema infectiosum)

What is fifth disease?

Fifth disease is an infection caused by the virus, parvovirus B19, which normally causes a mild rash in humans. It affects all age groups, but commonly children aged 5 to 15.

How is it spread?

Fifth disease is a highly contagious disease, and is spread by airborne droplets of respiratory secretions (saliva, sputum), often when people sneeze or cough. It only affects humans so people can not catch it from pets.

Symptoms of fifth disease

The characteristic symptom is the development of a "slapped-cheek" appearance, with evolution to a lacy, generalised rash on the body. The rash will usually resolve in 7-10 days.

Sometimes, for a couple of weeks before the rash, the person may have "flu-like" symptoms, such as malaise, a runny nose, sore throat, headache and occasionally a fever. It is during this stage of the illness that people are infectious.

The symptoms generally develop 4-20 days after the person is infected.

The majority of affected adults will also experience joint aches and pains, which can last for days to months.

How serious is fifth disease?

Most people who suffer fifth disease overcome the illness without any complications. However, people who are immunosuppressed or who suffer from pre-existing anaemia may develop severe, chronic anaemia, and often remain infectious for a prolonged period.

About 50% of adults have developed immunity to the virus, because of past infection (some without any symptoms), and are protected from getting it again.

For most pregnant women who develop fifth disease, there are no serious complications for them or their unborn baby. However, in less than 5% of all pregnant woman, parvovirus infection will cause the unborn baby to have severe anaemia and the mother may have a miscarriage. This more commonly occurs with disease acquired during the first half of pregnancy.

Treatment

For most people, symptomatic relief with fluids, paracetamol and rest is all that is required. If the skin rash is itchy, your doctor can advise you regarding the best creams and lotions to use.

As fifth disease is caused by a virus, antibiotics are not helpful.

For pregnant women, and for those who are immunosuppressed, who may have been in contact with someone with fifth disease, or who think they may have the disease, it is a good idea to contact your doctor. They may wish to perform a blood test to determine whether or not you are infected, and can discuss with you the treatment options available.

How can fifth disease be controlled?

At present, there is no vaccine available for fifth disease.

Maintaining good hygiene is the best way to stop the spread of parvovirus. Always cover your mouth and nose when coughing and sneezing. Practise hand-washing after using tissues or handkerchiefs and after coughing or sneezing.

Clean surfaces contaminated by discharge from nose and throat.

As people are not infectious once the rash appears, they should not be excluded from child care, preschool, school or work.

For more information contact your nearest Centre for Disease Control

Further fact sheets and treatment protocols are available at: http://www.nt.gov.au/health/cdc

Outbreak of gastroenteritis due to *Salmonella* Typhimurium phage-type 135 linked to consumption of meat rolls and sandwiches at a food outlet

Karen Dempsey, Enteric Disease Epidemiologist, CDC*
Peter Markey, Head of Surveillance, CDC
Rachael Gaffney, Environmental Health Officer, Darwin Urban Environmental Health Unit
Barbara Klessa, Manager Darwin Urban Environmental Health Unit

Background

On 3 February 2003 the Centre for Disease Control (CDC) in Darwin received notifications of salmonellosis in a husband and wife. An interview revealed the couple had eaten at several food outlets prior to becoming ill and no obvious point source was determined. However, the next day a further case of dysentery was notified by a hospital medical officer and the interview revealed that the case had eaten at the one of the outlets mentioned by the couple during the same time period. In addition the case identified 2 other people who had become ill with gastrointestinal illness following consumption of food at that outlet.

Public Health Action

The Environmental Health Unit conducted an inspection of the premises and issued a notice advising the management to rectify potential cross-contamination factors and temperature control issues. Follow-up inspections revealed good compliance and, apart from a few days when changes were being implemented, the outlet continued to trade normally.

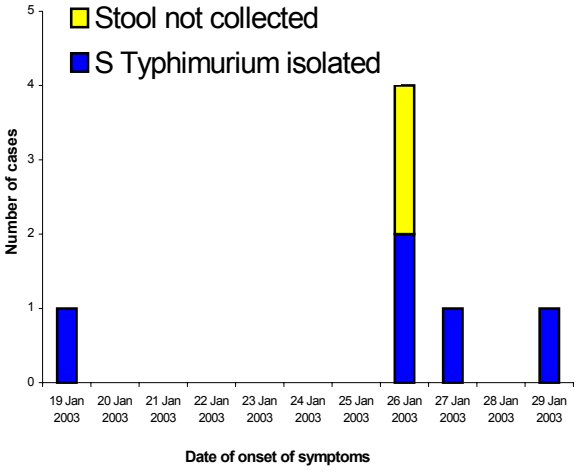
The investigation team initiated active case finding of all salmonellosis cases diagnosed, in Darwin, after January 2003. This revealed 2 more cases of salmonellosis linked to the food outlet.

The identification of 2 additional epidemiologically linked cases was sufficient evidence to initiate further action and environmental health officials revisited the food outlet. Several food samples were collected for testing and sent to the Institute of Veterinary and Medical Science (IMVS) in South Australia.

Results

Seven cases of gastroenteritis were associated with the consumption of a variety of food items served by the food outlet. The median age was 27 years, 4 were female and 3 male. The onset date ranged between 19 January 2003 to the 26 January (see figure 1) and the median incubation time was 18 hours. Profuse diarrhoea, including bloody stool in 1 case, severe abdominal pain and fever were the predominant symptoms. The majority of cases did not vomit. There were no admissions to hospital, although 1 case required intravenous fluids at the Royal Darwin Hospital (RDH) Emergency Department. Symptoms lasted between 42 to 144 hours and the median duration of illness was 96 hours.

Figure 1. Epidemiological curve of gastroenteritis cases and date of onset of symptoms



Analysis of the food samples revealed the presence of coliforms and *E. coli*, however *Salmonella* sp. were not detected. The presence of coliforms and *E. coli* suggested either pre- or post-cooking contamination.

Subsequent sero-typing and phage-typing revealed that all 5 isolates were *S.* Typhimurium phage-type 135. *S.* Typhimurium is responsible for 40-70% of cases of human salmonellosis and is the most common *Salmonella* serovar causing food-borne illness in humans.[1] Phage-type 135 is

one of the most common phage-types of *S.* Typhimurium and has been linked to several of large outbreaks of food-poisoning involving raw egg in Australia,[2-4] It is one of the 5 main commonest isolates recovered from poultry. [2-5]

Discussion

E. coli contamination of food may come about pre- and post-cooking. Pre-cooking contamination occurs when raw food items come in contact with faecal contents during processing. Raw meats, particularly poultry, are susceptible to pre-cooking contamination and, even with the most careful husbandry and processing practices, sterility of raw meat products cannot be guaranteed. However adequate thawing of raw meats, high cooking temperatures (100^0C or higher) and adequate cooking time will kill most organisms, including *E. coli* (personal communication, Agnes Tan, food microbiologist, MDU).

Post-cooking contamination occurs when inappropriate food handling techniques are used such as lower than recommended bain marie temperatures (i.e. below 60^o C), inadequate hand washing and shared utensils. Inspection of the outlet identified significant potential for cross-contamination to occur between raw and cooked food products held in cold storage. Cross-contamination was also likely to occur due to the close proximity of cooked products in the servery and the shared use of a single knife and tongs for multiple food items.

Despite the inability to detect *Salmonella* in the food samples, adequate biologically plausible and temporal associations linked the salmonellosis to the consumption of food at this outlet. A variety of cooked meat rolls and sandwiches were consumed by all but one of the cases on the same day (Sunday, 26 Jan 2003). The other case consumed a cooked meat roll on the Friday of the previous week. It is possible that a particular food item was contaminated with *Salmonella* sp. on these 2 occasions but was not contaminated on the day the food samples were collected. It is also possible that the contaminated food item was not available for testing on the day of collection. Indeed one food item, turkey, was not available on the day of collection because it is only cooked 3 days a week. Poultry are frequently contaminated with *S.* Typhimurium and phage-type 135 is commonly isolated in raw chicken. On the basis of this information turkey samples will be collected for testing when available.

This outbreak was discovered when 2 related cases of gastroenteritis coincided with the notification of a third case by an astute medical officer who was suspicious that a particular food outlet was the source. Health professionals working with the general public are sentinel to enteric disease surveillance and the importance of their role in preventing the spread of enteric diseases cannot be overstated. This role is highlighted in the Communicable Disease Surveillance Guidelines for reporting notifiable conditions. The Guidelines recommend that health professionals notify their local (CDC) if gastroenteritis occurs in 2 or more epidemiologically linked cases, any institutional setting (schools, child care centres, nursing homes, hospitals, barracks, camps, other institutional care) or in a professional food handler. Clearly the take-home message from this outbreak is the importance of medical practitioner notifications combined with vigilant public health follow-up of laboratory confirmed salmonellosis cases.

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Wet season Cryptosporidiosis fails to appear in Darwin in 2002-03

Peter Markey, Head of Surveillance, CDC Darwin

In the wet seasons of 2000-01 and 2001-02 the greater Darwin region experienced epidemics of cryptosporidiosis with December to May notifications totalling 83 and 76 respectively.[1-3] Notified cases were confined mainly to non-Aboriginal children under the age of 5 and were sometimes associated with child care centres or swimming pools. In February 2002, the epidemic resulted in the closure of a suburban public swimming pool, while repairs and hyperchlorination were carried out.

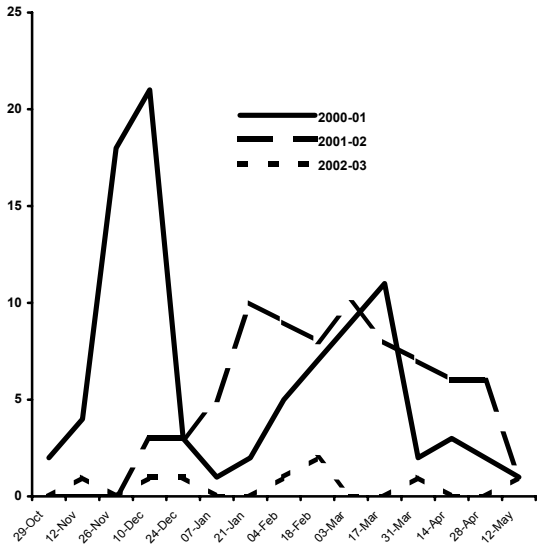
These trends were also reflected at the national level. Cryptosporidiosis became notifiable by all jurisdictions in January 2001 and since then there has been a peak in notifications in February and March each year. Queensland had a large outbreak in the summer of 2001-02 and reported 2088 cases for 2002, or 63% of the national total.[4] In February 2002 there were 980 cases notified nationally, with over 700 being notified for Queensland,[4] compared with a national monthly mean of 195 cases since January 2001. Despite the high numbers in Queensland, the NT had a higher rate of disease in the 1st quarter of 2002 (218 cases per 100,000 vs 179 cases per 100,000 in Queensland).[4]

In December 2002, the Centre for Disease Control (CDC) issued warnings to the media, child care centres and suburban swimming pools about the risk of cryptosporidosis and reinforced the previous advice about prevention.[1]

The epidemic failed to materialise in the wet season of 2002-03 in Darwin. There were only 7 cases in December-May in the greater Darwin area (see Figure). Likewise nationally numbers of cases were down although there has been an increase in WA in 2003 compared with 2002.[5]

Although it might be satisfying to conclude that the pre-emptive warnings issued by CDC were causally related to the decrease in notifications, the fact that the epidemic did not recur in Queensland suggests that other environmental factors have played a part in the reduced transmission of the organism. Indeed, even though the literature reports transmission as occurring through water supplies, through the use of swimming pools and through person-to-person spread, the pattern of the outbreaks in Northern Australia in early 2001 and 2002 suggests other environmental factors may have a role. For example, the wet season in 2001-02 was drier than average and may have meant more people were swimming compared with the wetter than average 2002-03 season.

Figure. Cases of cryptosporidiosis in Darwin Urban District by fortnight, last 3 wet seasons.



Large seasonal fluctuations in cases of cryptosporidiosis have been reported elsewhere as have coincidental increases in regions adjacent to an outbreak.[6] Researchers have raised the possibility that this latter phenomenon is due to a change in behaviour and practise, (more doctor attendance and more proficient testing) which is likely to happen in areas surrounding an epidemic, or when there is a new surveillance system in place, rather than due to a true increase in incidence. However, it seems unlikely that this is the case in Darwin which is reasonably isolated and where the surveillance system has been in place for some years. We await the next wet with anticipation.

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6. Naumova EN, Chen JT, Griffiths JK, Matyas BT, Estes-Smargiassi SA, Morris RD. Use of passive surveillance data to study temporal and spatial variation in the incidence of giardiasis and cryptosporidiosis**.** *Public Health Rep.* 2000 Sep-Oct;115(5):436-47.

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Enteric diseases in the Northern Territory
First quarter report
January – March 2003

Karen Dempsey, Enteric Disease Epidemiologist*, CDC Darwin

Campylobacteriosis

There was a 2 fold increase in the number of Campylobacter notifications during the first 3 months of 2003 compared with notifications for this time last year. This increase was in contrast to the declining trend in campylobacteriosis observed over the past few years, particularly in the Alice Springs rural district. The most noticeable increase occurred in the Alice Springs urban community where there were 22 cases for the first quarter of 2003 compared with 6 for the same period in 2002.

While the increase in campylobacteriosis among females was spread across all age groups, a noticeable increase was observed among male children less than 5 years of age. There was a 5 fold increase in cases among this age group relative to the 2002 first quarter. The incidence of campylobacteriosis increased in both Indigenous and non-Indigenous persons.

Cryptosporidiosis

The incidence of cryptosporidiosis was much lower during the first quarter of 2003 than for the same period last year. There were no clusters of cases observed and consequently no association with swimming pools or child care centres.

Haemolytic uraemic syndrome

One case of sporadic haemolytic syndrome was notified this year in a non-Indigenous woman (there were no cases in the whole of 2002). The causative organism was not identified and despite an extensive food history being conducted no food items were identified as the potential exposure.

Hepatitis A

There was a 2 fold increase in the number of hepatitis A notifications and the increase was most noticeable in the Top End. Darwin notifications were more or less evenly distributed between the rural and urban area of the Darwin district. In the Darwin cases person-to-person transmission was observed in 2 instances but for the reminder no links to other cases were detected.

Listeriosis

No cases of listeriosis were detected in the Northern Territory during January to March 2003.

Rotavirus

Rotavirus cases were slightly lower than this time last year however as this disease is most

frequently observed in the winter months it is too early in the season to predict whether an outbreak will occur based on current figures.

Salmonellosis

The numbers of Salmonella notifications were slightly less than that recorded for 2002 first quarter. The largest decline in salmonellosis occurred in Darwin urban where almost half the number of cases were notified in 2003.

The decline in cases was fairly evenly distributed across the sexes but less evenly distributed by Indigenous status. While there was little change in the number of Indigenous cases there were noticeably fewer cases among non-Indigenous persons. The median ages for salmonellosis in males and females was 2 years or less.

Salmonella Ball was the predominant salmonella serovar during the first quarter of 2002. There were fewer cases of this serovar during the beginning of 2003 and the predominant serovar for this quarter was *Salmonella* Typhimurium reflecting a possible increase in food-borne salmonellosis. Another noticeable increase was observed in the number of *Salmonella* Havana notifications increasing from 1 notification in 2002 to 7 in 2003.

Shigellosis

Shigella notifications increased during the first quarter of 2003 compared with 2002 and, like campylobacteriosis, the most noticeable increase occurred in the Alice Springs urban community. Shigellosis increased from 2 cases per quarter in this township to 16 cases in 2003.

Males were relatively unaffected by shigellosis. In contrast, the number of female cases of shigellosis almost doubled in the first quarter of 2003 relative to the same period in the previous year, mainly in girls under 5 years of age. The incidence of shigellosis was much higher in Indigenous persons for both years and the majority of the increase in notifications occurred among Indigenous persons.

** Funded by OzFoodNet*

Yersiniosis

One case of yersiniosis was detected in an Indigenous woman during January to March 2003. In 2002 there were 4 cases notified.

Outbreaks

Three clusters of gastroenteritis occurred in the Darwin urban area and were reported to the Darwin Centre for Disease Control for follow-up. The first, a cluster of 5 cases of confirmed salmonellosis occurred over the long weekend in January. Investigation of the cases determined that a particular food outlet was the common exposure to all cases. However the type of food was not identified as multiple types of food were consumed. A contaminated poultry item was thought to be the source of the organism and it was likely that other food items were implicated due to cross contamination.

The second cluster of gastroenteritis was reported after 12 adults became ill 35 hours following attendance at a function catered for by a local catering company. Multiple food items were eaten and it was not possible to identify a suspect food item as all food items were discarded after the function finished. Convalescent stools were collected from 4 of the attendees however no organisms were detected (possibly due to the delay between illness and collection). Despite the lack of microbiological evidence, the likely organism was thought to be norovirus because the predominant symptoms of vomiting and nausea and the incubation period of 35 hours typified the case definition for unconfirmed norovirus (formerly known as Norwalk virus) .

The third cluster involved a childcare centre in which 12 out of 16 children under 2 years of age were reported ill with gastroenteritis 24 to 48 hours following a single incident of vomiting in the nursery. Stools confirmed the causative organism as calicivirus. The person to person spread of the illness was high with 6 siblings and 12 parents affected subsequent to exposure from their sick children.

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NT NOTIFICATIONS OF DISEASES BY ONSET DATE & DISTRICTS
1 JANUARY TO 31 MARCH 2003 AND 2002

DISEASES	ALICE SPRINGS		BARKLY		DARWIN		EAST ARNHEM		KATHERINE		TOTAL	
	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002
Acute Rheumatic Fever	5	4	0	0	3	9	0	7	0	5	8	25
Adverse Vaccine Reaction	1	1	2	0	4	9	0	1	2	0	9	11
Amoebiases	0	0	0	0	1	0	0	0	0	1	1	1
Arbovirus infections												
Barmah Forest Virus	0	0	0	1	7	5	1	5	0	1	8	12
Dengue	0	0	0	0	6	19	0	0	0	0	6	19
Ross River Virus	0	0	1	1	79	16	9	3	15	13	104	33
Campylobacter	44	18	3	1	47	31	1	1	6	0	101	51
Chlamydia	194	90	4	8	160	130	38	25	35	48	431	301
Chlamydia Conjunctivitis	2	1	1	0	30	7	5	23	4	3	43	34
Congenital Syphilis	1	3	0	0	0	0	0	0	0	0	1	3
Cryptosporidiosis	23	23	1	4	10	59	15	9	7	15	56	110
Donovanosis	2	0	0	1	2	0	0	0	0	3	4	4
Gastroenteritis	0	0	0	0	0	1	0	0	0	0	0	1
Glomerulonephritis	0	1	0	0	0	0	0	1	0	1	0	3
Gonococcal Disease	177	187	8	14	134	106	43	33	16	55	378	395
Gonococcal Conjunctivitis	0	1	0	0	0	0	0	0	0	0	0	1
Haemolytic Uraemic Syn	0	0	0	0	1	0	0	0	0	0	1	0
Haemophilus Inf type b	0	0	0	0	0	1	0	0	0	0	0	1
Hepatitis A	4	1	0	0	10	2	0	0	4	6	18	9
Hepatitis B (incidence)	2	2	1	0	2	2	0	0	1	0	6	4
Hepatitis C (prevalence)	4	5	0	1	32	34	1	1	3	3	40	44
HIV infections	0	1	0	0	0	1	0	0	1	0	1	2
HTLV-1	3	4	0	0	1	2	0	0	0	1	4	7
Influenza	1	1	0	0	0	3	0	0	1	0	2	4
Legionnaires Disease	0	0	1	0	1	0	0	0	0	0	2	0
Leprosy	0	0	0	0	0	0	0	0	0	1	0	1
Leptospirosis	0	0	0	0	0	1	0	0	0	0	0	1
Malaria	2	0	0	0	10	8	1	0	0	0	13	8
Melioidosis	2	1	0	0	9	11	0	0	2	1	13	13
Meningococcal Infection	0	1	0	0	1	0	0	1	0	0	1	2
Pertussis	0	3	0	0	0	25	3	0	1	0	4	28
Pneumococcal Disease	3	5	2	2	7	4	1	0	0	1	13	12
Q Fever	0	0	0	0	1	1	0	0	0	0	1	1
Rotavirus	2	6	0	0	8	6	1	2	1	2	12	16
Rubella	0	0	0	0	0	1	0	0	0	0	0	1
Salmonella	26	27	5	1	50	69	5	3	29	30	115	130
Shigella	41	16	1	0	3	18	1	0	2	2	48	36
Syphilis	27	32	1	1	21	34	5	6	13	18	67	91
Trichomonas	60	52	3	3	49	75	36	14	16	47	164	191
Tuberculosis	2	2	0	0	1	6	1	0	1	5	5	13
Yersiniosis	0	0	0	0	0	4	1	0	0	0	1	4
Total	**628**	**488**	**34**	**38**	**690**	**700**	**169**	**135**	**160**	**262**	**1681**	**1623**

Points to note regarding notifications:

Anthrax, Murray Valley Encephalitis, Kunjin, Kokobera, Atypical Mycobacteria, Botulism, Brucellosis, Chancroid, Cholera, Congenital Rubella Syndrome, Diphtheria, Gonococcal Opthalmic Neonatal, Haemophilus Influenza not type b, Hepatitis C (incidence), Hepatitis D & E, Hydatid Disease, Listeriosis, Lymphogranuloma venereum, Measles, Mumps, Orthithosis, Plague, Poliomyelitis, Rabies, Tetanus, Typhoid, Typhus, Vibrio Food Poisoning, Viral Haemorrhagic Fever, Yellow Fever, and SARS are all notifiable but had "0" notifications in this period.

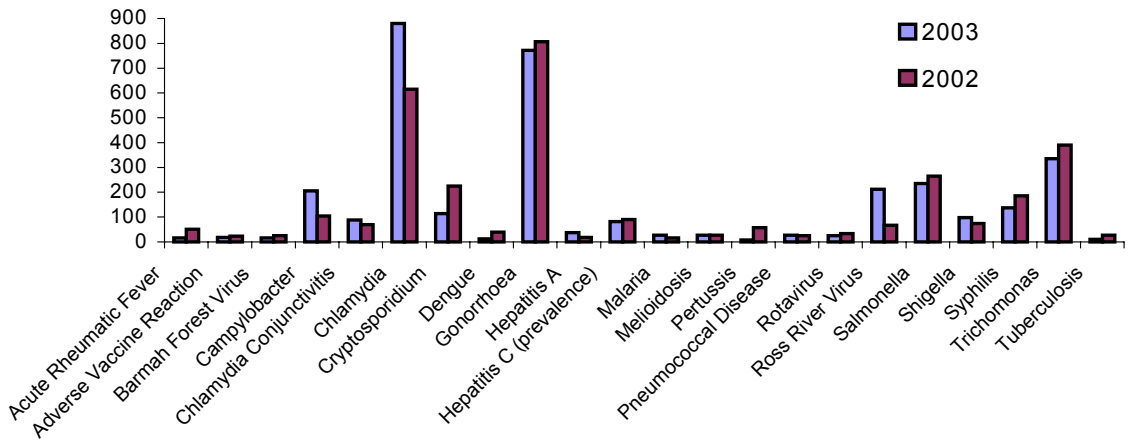
Genital chlamydia notifications are 43% higher for the first quarter of 2003, compared to the same period last year. This increase is consistent with the national trend for chlamydia notifications and may be the result of enhanced screening activity and heightened awareness among health care professionals, due to recent increases in heterosexual transmission of HIV in the NT.

NOTIFIED CASES OF VACCINE PREVENTABLE DISEASES IN THE NT BY ONSET DATE 1 JANUARY TO 31 MARCH 2003 AND 2002

DISEASES	TOTAL		No. cases among children aged 0-5 years	
	2003	2002	2003	2002
Congenital rubella syndrome	0	0	0	0
Diphtheria	0	0	0	0
Haemophilus influenzae type b	0	1	0	0
Hepatitis B	6	4	0	0
Measles	0	0	0	0
Mumps	0	0	0	0
Pertussis	4	28	0	8
Poliomyelitis, paralytic	0	0	0	0
Rubella	0	1	0	0
Tetanus	0	0	0	0

* Mumps is largely under-reported.

NT WIDE NOTIFIABLE DISEASES 1 JANUARY TO 30 MARCH 2003



Rates <10/100,000 not listed
NT est. resident population 195,905 supplied by Epidemiology a& Statistics Branch, DHCS

NT malaria notifications January-April 2003

Merv Fairley, CDC Darwin

Twelve notifications of malaria were received for the first quarter of 2003. The following table provides details about where the infection was thought to be acquired, the infecting agent and whether chemoprophylaxis was used.

Number of cases	Origin of infection	Reason exposed	Agent	Chemoprophylaxis
1	Indonesia	resident	P.vivax	no
1	East Timor	working	P vivax	yes
1	Ivory Coast	holiday	P vivax	yes
1	Zambia	holiday	P.falciparum	no
1	Solomon Is	resident	P.vivax	no
1	PNG	resident	P.vivax	yes
1	PNG	resident	P.vivax	no
1	PNG	holiday	P.vivax	no
2	PNG	holiday	P.vivax	yes
1	PNG	resident	P.falciparum	yes
1	PNG	holiday	P.falciparum	yes

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Disease Control Staff Updates

Darwin

Jade Neave has joined the AIDS/STD Program to work with itinerant people in the Darwin urban area. Jade has previously been working as an AHW at Danila Dilba. Andrew Seymour has commenced as Administration Officer Clinic 34, Andrew has previous experience in working with the AIDS Council in Canberra. Rural AIDS/STD Program Coordinator, **Matthew Parnaby** has resigned and is waiting placement in an overseas program.

Tennant Creek

CDC public health nurse, **John Turahui,** has left and will be relieving in remote clinics for the next few weeks then taking leave until November. **Linda O'Halloran** will be taking his position during this time. Linda has lived in Tennant Creek since 1983 and has spent the last 5 years in community health, domiciliary and palliative care. Linda has relieved in CDC previously in the AIDS/STDProgram position.

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